Product Spotlight on third party SNA gateways

IBM WORLD

July 15, 1988

Council maps on vast System/38 network

Burgeoning market for SNA gateways

AS/400 under the microscope

Australian Customs moves into new IBM age

Bank instals e-mail IBM couldn't supply

Effective management of heterogeneous networks

Linking DEC and IBM without ruffling feathers

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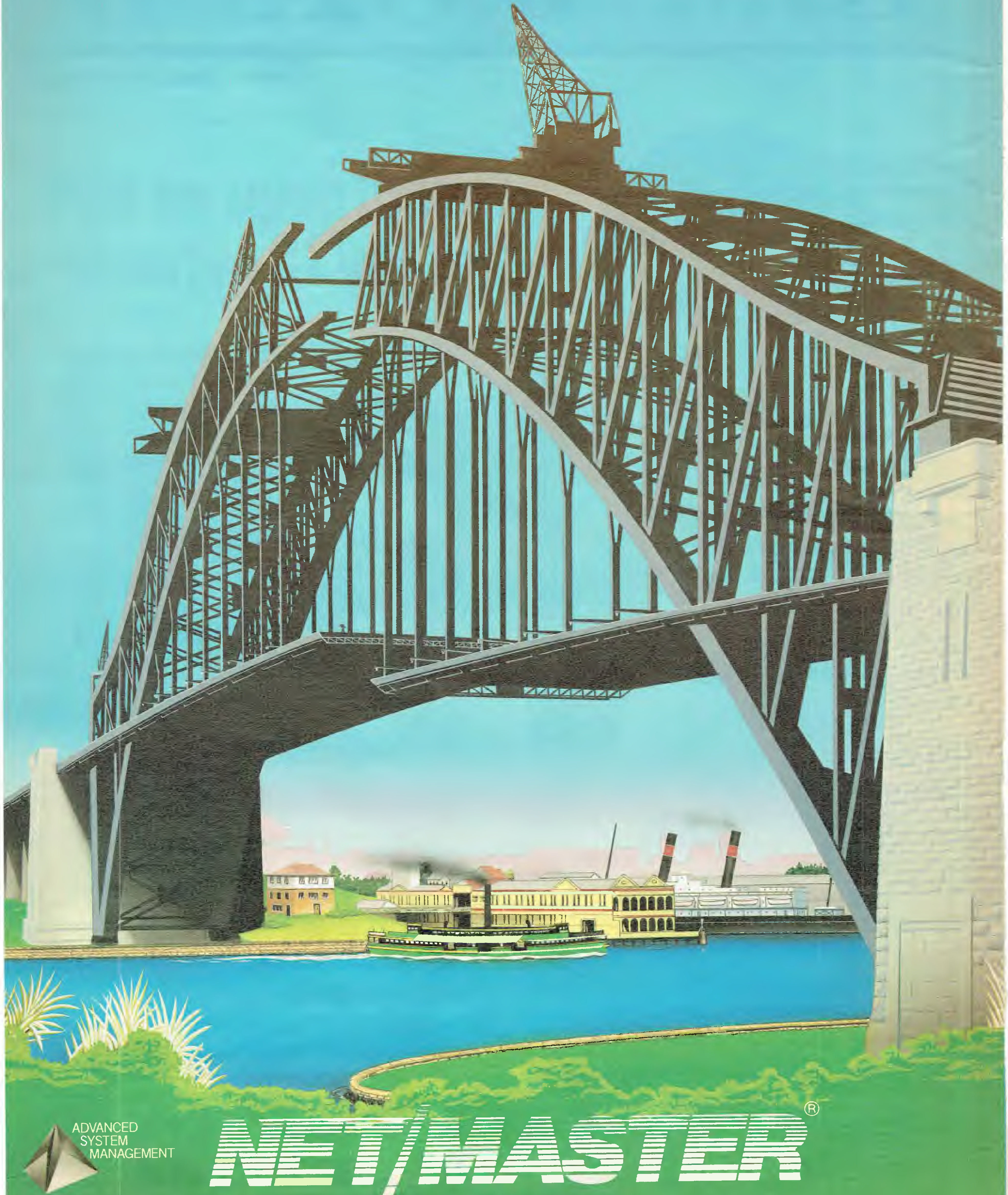
WHEN GOOD MANAGEMENT IS A MATTER FOR THE FUTURE



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Same old problems

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If users and vendors want to be included in the mainstream they must figure out how their non-Blue systems will communicate with IBM's.

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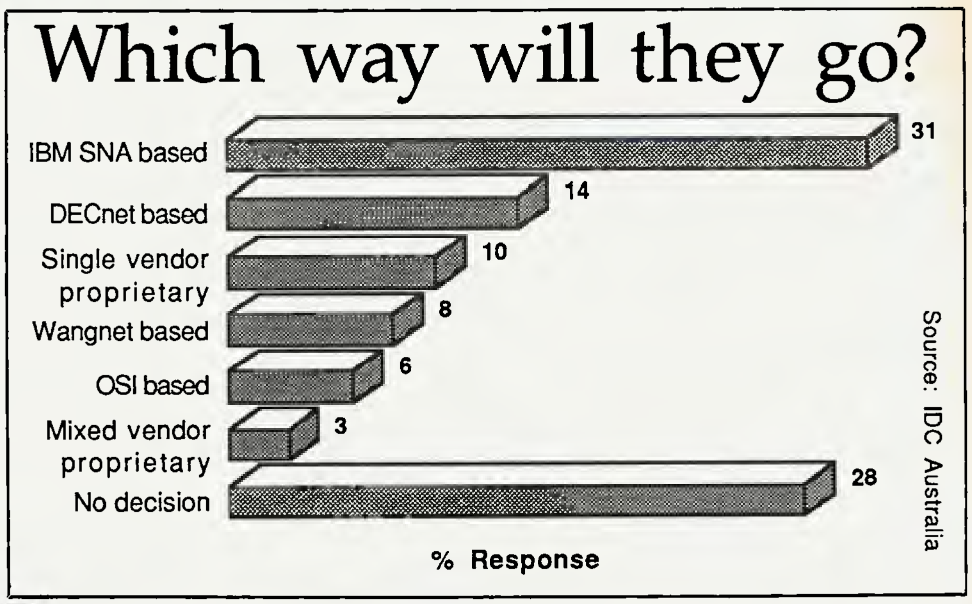

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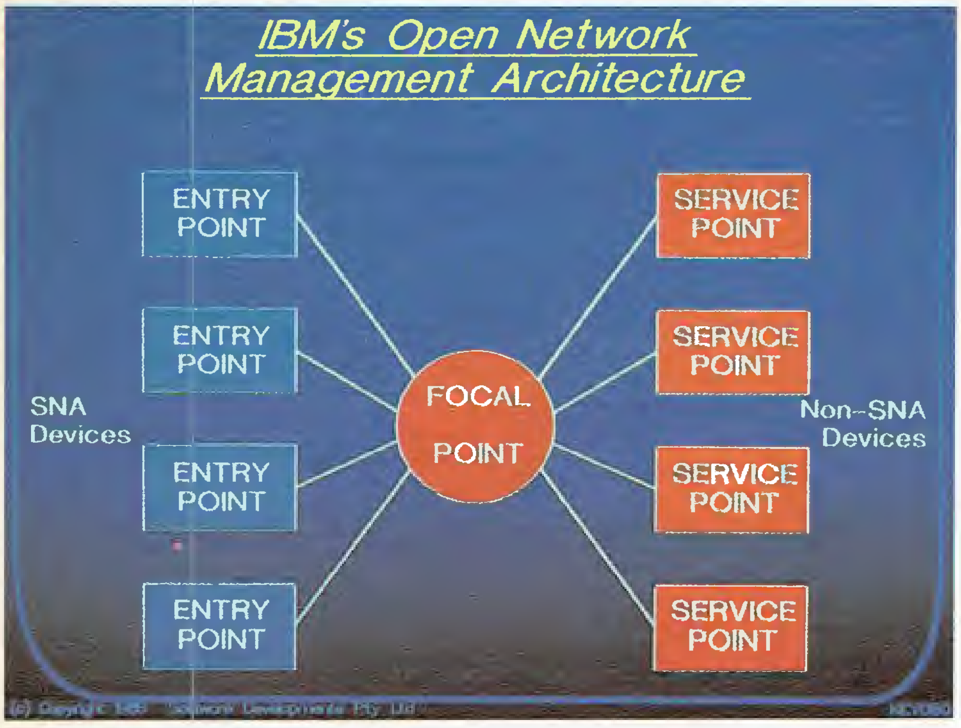


■ *Fig 2: Implementation of the three entities — a focal point, an entry point and a service point — on which IBM's architecture rests*

Multi-vendor nets

(Continued from page 7)

code to provide support of the SNA network management architecture. Similarly, a 3270 series cluster controller from a Plug Compatible Manufacturer (PCM), such as the Memorex 2374, is also an entry point.

Another example of an entry point is the SNA Hub from Netlink. This is an SNA device that acts, in its primary role, as a concentrator of 3270 series cluster controllers. It also implements network management functions that conform to the IBM network management architecture.

A further example of an entry point is the SNA Gate from the same company. This protocol converter for asynchronous terminals emulates a 3270 series cluster controller. Again, the microcode implements network management support for the attached devices.

In fact, neither the asynchronous terminals attached to the SNA Gate, nor the 3278 and 3178 terminals attached to cluster controllers are SNA devices. But from the point of view of SNA connectivity, they are seen by the host as SNA devices on the SNA network.

In contrast, devices managed through a service point are not provided SNA connectivity by the service point, and are therefore not seen as SNA devices by the host.

There are no products on the market that implement the service point concept, as defined by the architecture. One vendor has a PC-based product that is sometimes incorrectly described as a service point. But the product only accepts SNA-format network management data and does not carry out the principal function of a service point as defined in the architecture, namely conversion between SNA and non-SNA formats.

Net/Master from Software Developments is an example of an implementation of a focal point. It accepts SNA format management data from entry points (and hypothetical service points), and provides centralised processing of this data, and control of the network.

Working together

As the diagram illustrates, IBM's network management architecture allows hardware and software from different vendors to work together in an SNA-based network. Compatibility is ensured by use of the same IBM protocol for network management communications. IBM originally used a range of different network management record formats. But as part of its definition of a network management architecture, IBM standardised on a single record format as its protocol for network management data transport. This record, the Network Management Vector Transport (NMVT), has a format that is well defined in the relevant IBM protocol specification manual.

The architecture is defined in conceptual outline in terms of three entities as noted above, and defined formally in specifications of management services and of the standard communications protocol.

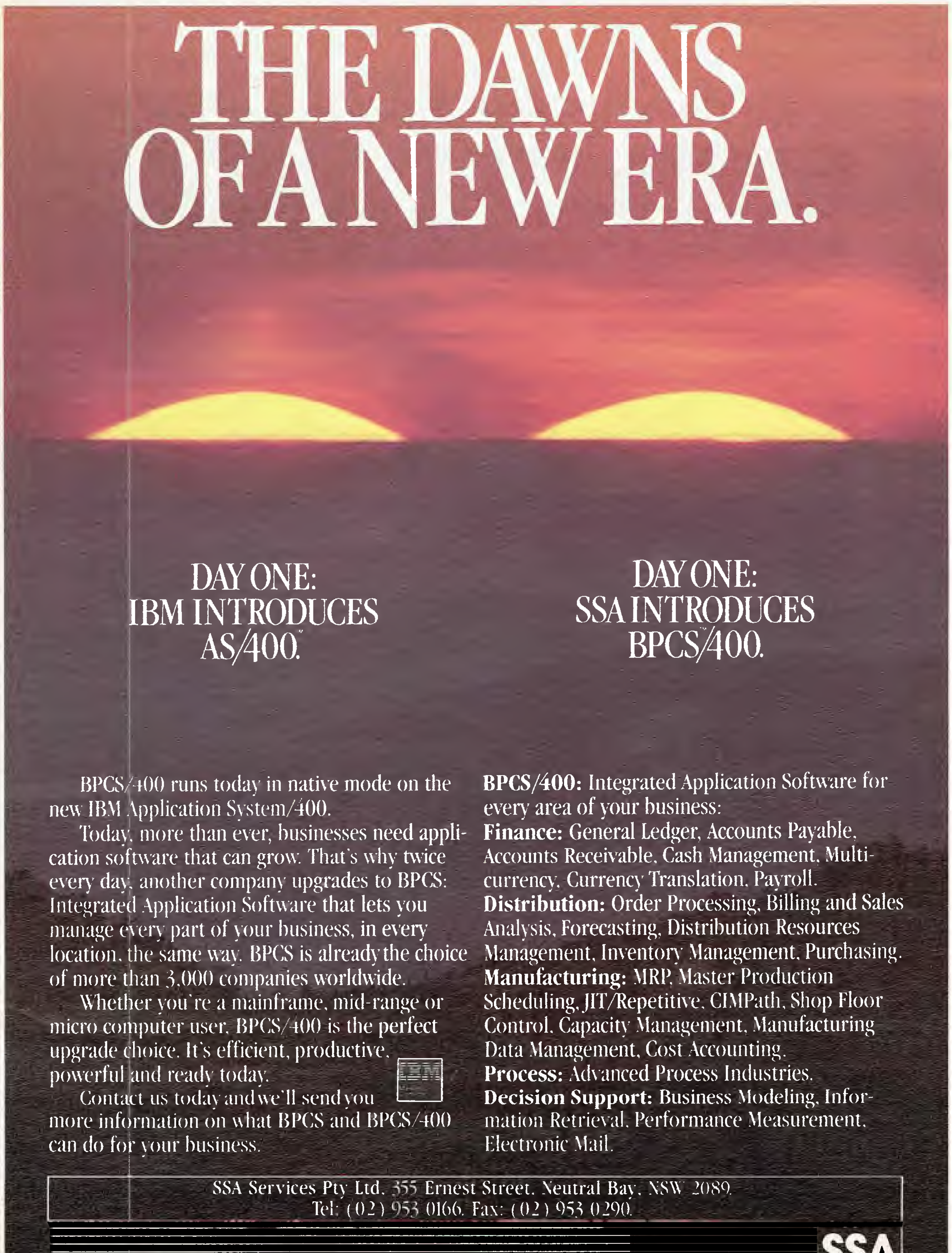
IBM's network management architecture divides network management into four categories of management services:

- Problem management;
- Performance and accounting management;
- Configuration management; and
- Change management.

The architecture is still evolving and full specifications of these areas have still to emerge from IBM. Problem management is now the most well-defined category. It is defined to comprise five sub-categories, of which the first two have been specified. Performance and accounting management is defined to include seven sub-categories, of which one has been specified. Configuration management and change management services have not yet been defined at all.

The IBM management architecture works well for a pure SNA network. The management concepts of focal points and entry points are well matched to the hierarchical structure of the SNA communications architecture. Centralised management of a pure SNA network can be performed effectively and efficiently at a focal-point System/370 host.

But as noted earlier, networks are becoming increasingly heterogeneous. Along with this comes a tendency for networks to be organised on a peer basis. Figure 3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SSA

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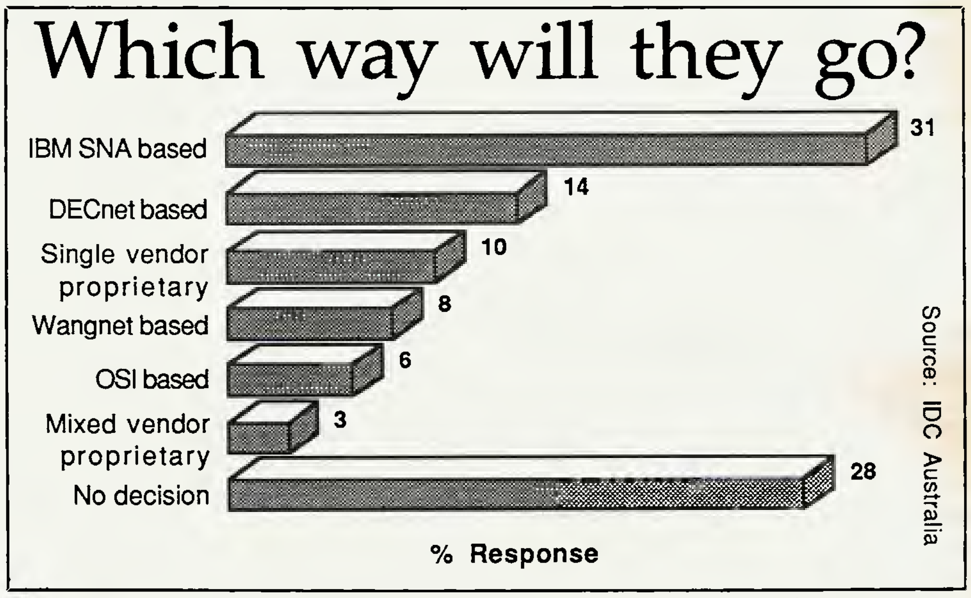

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Farewell APSS

Colin Brammall tells how Netlink hubs help Customs make SNA switch

THE Australian Customs Service is both a pioneer and old-fashioned in computing — but on January 1 next year it will end its old-fashioned days. For on that day it will switch off the last of the only terminals left in the world operating under APSS protocols. APSS stands for Australian Public Service Standard, adopted in the 1970s in the absence of international standards.

In their place will be de facto standard IBM equipment, and making the links from many of outlying sites in the huge national network will be an Australian-designed product, the Netlink SNA hub.

Customs has 11 of these hubs, not much bigger than small facsimile machines, which do the work of more expensive frontend processors on sites with 15 or fewer terminal clusters (see technical detail on page 6). Customs staff all over Australia will heave a collective sigh of "good riddance".

Customs' pioneering work in computing began in 1972 when its ICL 4/72 went live with Inspect (integrated nationwide system for processing entries), a program which processed goods declarations by customs agents and importers.

Five months later it went live with Search (select entries and report to customs houses), a database of Inspect. A little over two years later, Compile (customs online method of preparing from invoices lodgeable entries) was born — a joint Customs/private enterprise project which allowed customs agents to cut the paperwork and enter their information directly into the system.

Apart from these "commercial" applications, Customs also developed a program for processing passengers arriving in Australia: Pass (passenger automatic selection system), Pics (passport issue and control system, since taken over by Foreign Affairs), Scribe (a correspondence tracking and recording system, since overtaken by other systems) and others in association with the Australian Federal Police and the Corporate Affairs Commission.

In 1980, the workload required an upgrade, and after the exhaustive government tendering process was completed, Sperry (now Unisys) got the contract. An 1100/81 was installed in November 1981. This was upgraded to an 1100/82 in June 1982 and to an 1100/83 in March 1983. A second machine, an 1100/92, went into service in 1986.

■ *Phil Laird . . . 'restricted'*

In the meantime, the original Compile has been split in two to create Clear (control and clearance of lodged entries using ADP resources), Pass was redeveloped and Search was replaced by Trace (total retrieval and analysis of Customs entries).

All of this had been done on a network using the outmoded and discomforting APSS protocols. Only a few other government agencies were using APSS just a handful of years after its adoption, finally leaving Customs as the only one in the boat.

> ‘ Time-consuming tailoring of its comms every time it received a software upgrade ’

Today, Customs operates a variety of systems, including Unisys, Prime, NAS and IBM. It has three Sperry mainframes — two 1100/82s (about 4Mips) and an 1100/93 (about 20Mips), which is the largest Sperry processor in Australia, running the majority of large applications.

"We have been restricted in the Sperry environment in that there is a lot of software developed by government departments which we could acquire at no cost, except that the great bulk runs on IBM equipment," said Phil Laird, assistant secretary systems support.

"So for that reason, and to have more industry-standard equipment, we decided to acquire some IBM capability and, having done that, we had to support the two environments together."

The Sperry network supports APSS. "Most departments gave up APSS a long time ago when the rest of the world did not step behind it," Laird said facetiously. Customs was faced with time-consuming tailoring of its communications every time it received a software upgrade.

After a consultant reported on options, Customs decided about three years ago that 3270 and SNA were the way to go as a terminal protocol.

"We have been working towards changing over our network since then. We have acquired most of the terminals to replace

(Continued page 6)

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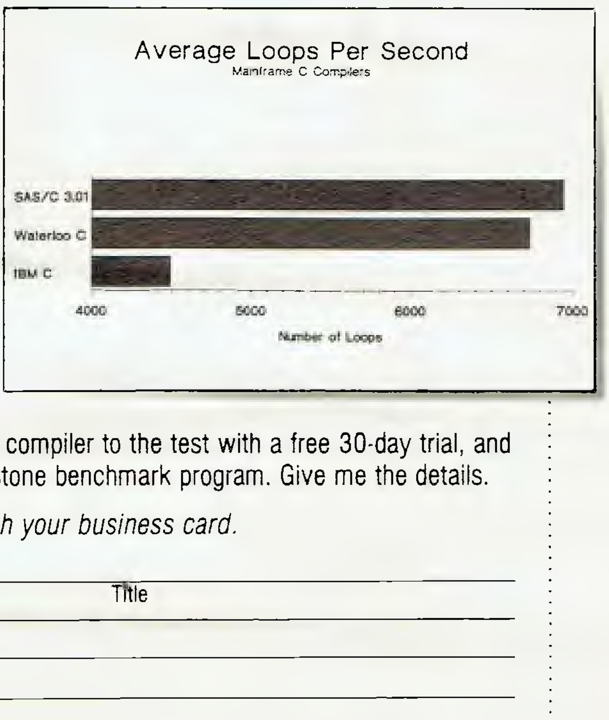

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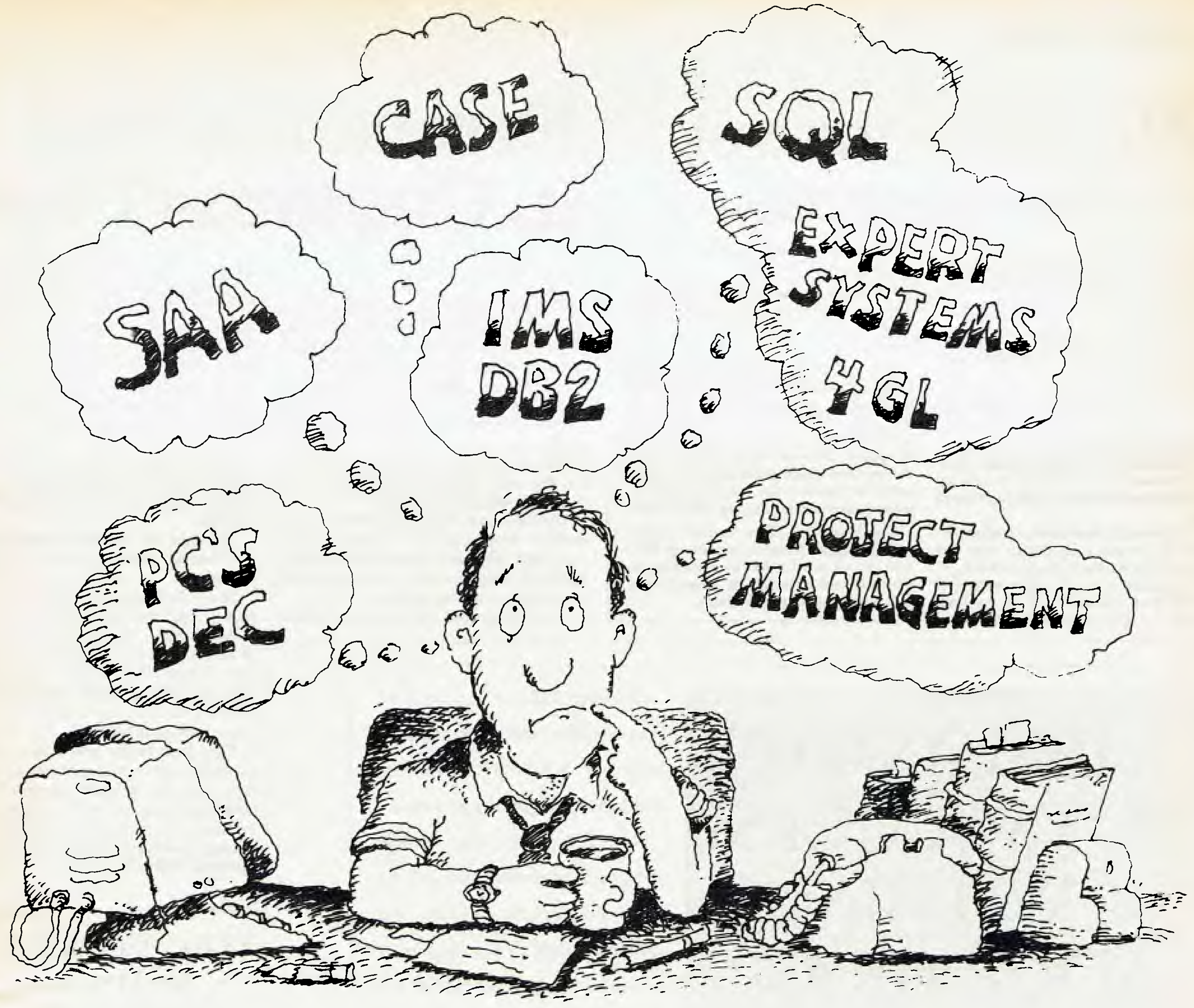

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SNA hub — the cost effective alternative

THE SNA Hub is "an easy and cost-effective alternative to IBM's remote version of the IBM 3270 network processor," said Netlink's federal accounts manager, Millard Lowe.

The SNA hub provides a variety of benefits in its role at the Australian Customs Service.

- It acts as a network concentrator, supporting lower speed links to IBM/Telex 3274 type terminal controllers from its high speed Host Link.
- It offloads the Canberra Host's frontend processor of a number of links by concentrating them into single high speed lines.
- It reduces the multi-device load on the frontend processor by taking over the downstream terminal device polling.
- It provides a much easier means of control and management of terminal devices via simple and dynamic (realtime) reconfiguration facilities.
- It accommodates more than two hundred 3270 terminal devices and their controllers for a third of the cost of the alternative.

The Australian Customs Service also found the SNA Hub's multi host link faciliy of use in allowing multiple controllers and devices dual access to their Sperry and IBM host computers. This was done by typing in "Select A" or "Select B" at the terminal. Each of 200 terminals could select or deselect the required host dynamically without affecting other users.

The SNA Hub offers several benefits over Telecom's Netplex/Netstream services as well as providing a sound base on which to take advantage of Aussat's services as they become available.

Farewell APSS in Customs Dept

(Continued from page 4)

the old APSS terminals, and we have gone through tender to acquire IBM 3745 and 3720 frontend processors, which are being installed right now around Australia.

"So we are supporting both IBM and APSS protocols — we still have 2200 APSS terminals and about 500 IBM-compatible ones — but by January 1, 1989, we will cease support for APSS. We are the only users in the world of those terminals (supplied by AWA)."

Customs had stuck with APSS not because it wanted to, but because it was a very large user and it knew the transition would be a big operation. Eventually, and at last, the time had arrived.

The changeover, naturally, was improving connections with the rest of the world — Customs has "business partners" such as 600 or so customs agents and importers as well as banks, airlines and shipping companies, and so on, and 30 of its own offices around the country.

The agents are also changing over their links to Customs from APSS-protocol equipment, many going for PCs — which emulate 3270 readily — to give them greater flexibility within their own offices as well as to take advantage of the additional services that Customs will be able to provide.

The links are over leased Telecom lines to Customs' regional offices in the State capitals.

The hubs fit into the system in regional sites where there are small concentrations of terminals — fewer than 16 — to be attached, such as Townsville, Cairns, Darwin, Hobart, Perth airport, Adelaide airport, probably Geelong, possibly Albury, certainly Wollongong and Newcastle, and some provincial airports.

They look to the system like a cluster controller, but on the other side of the hub they actually support clusters. Over-simplified, they are an IT equivalent of a domestic Kambrook power board.

Larger numbers of terminals are hooked up using 3745s and 3720s.

> ‘ Over-simplified — an IT equivalent of a domestic power-board ’

Gordon Daws, director of communications systems support for Customs, said there were very few devices with the same capability on the market in the world, and he knew of none in Australia.

"That has been recognised by the Federal government in that they are available through a period contract," he said. "It is becoming a piece of bread-and-butter equipment for concentrations of SNA terminals in various government departments.

"There are a few organisations with feelers in this country offering concentration, but there is no support infrastructure in Australia and there is certainly little Australian content in the others."

Support in Australia was extremely important, Laird said. Customs had to have minimal downtime — it aimed for 99.85 per cent uptime — so "we must have good service and good support for the products we buy and we know from dealings with that company that we can get that support."

Daws added: "They were certainly a clear leader in our minds, given our consideration of cost-effectiveness, performance and so on.

"The alternative to the hubs would have been to buy more frontend processors," Laird said, "and of course you are then talking about many times the cost."

There was a simple mathematical equation in deciding between processors and hubs. "The cost-effectiveness starts to diminish fairly rapidly for the hubs once you exceed one," Daws said.

"And from a network management point of view, it is must easier to control 30 terminals hanging off a 3720 than two lots of 15 hanging off a hub."

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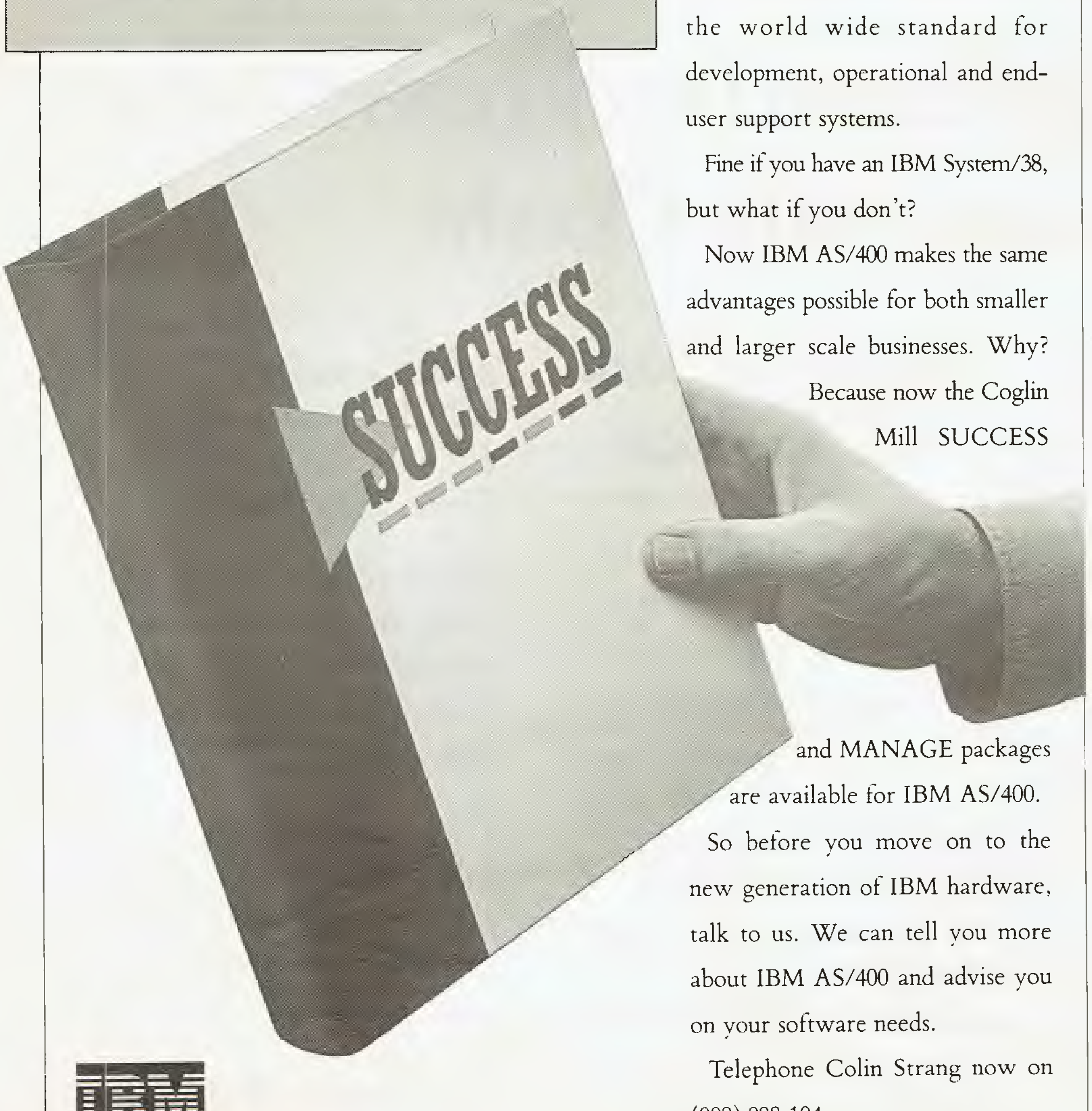

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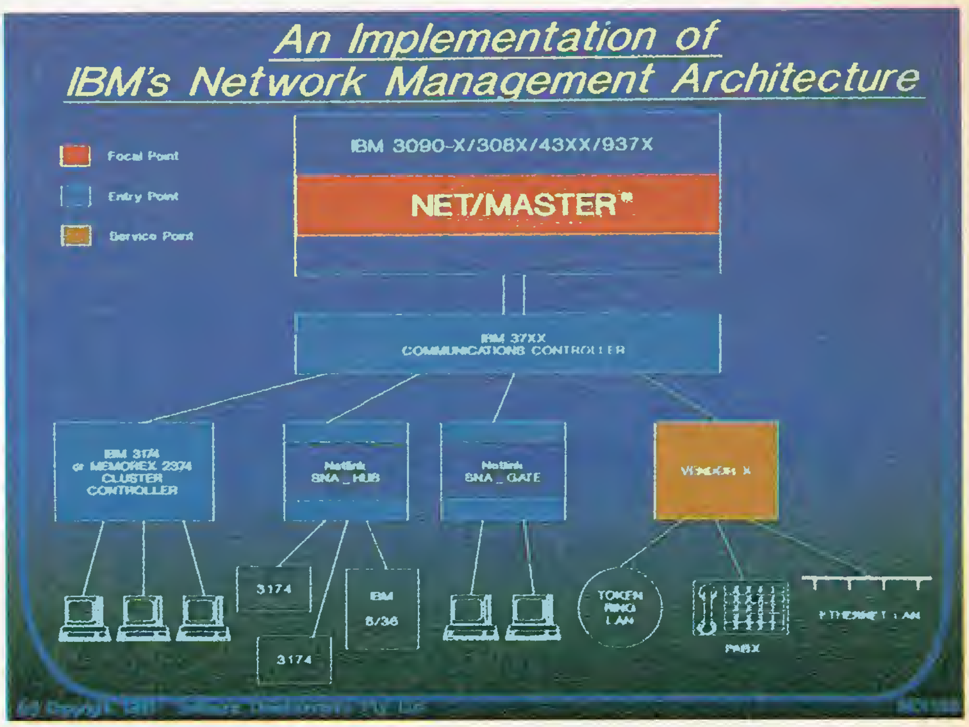
Multi-vendor nets demand peer approach

Heterogeneous networks are on the increase, and their management makes special demands, according to Joseph Fernandez



■ *Fig 1: This chart illustrates three network management entities and the relationships among them*

COMPUTER networking has evolved considerably during the past decade and two points have achieved increasing recognition. First, it has become evident that no single vendor can supply the best network for an organisation of any significant size; networks have become heterogeneous, and will become increasingly so. Second, computer systems are becoming totally reliant on networks, that are growing larger and more complex; hence, network management is essential.

The management of heterogeneous networks needs to be based on a coherent architecture in order to be effective. In late 1986, IBM defined an outline of an architecture, Open Network Management, whose goal was the management of communications networks that include both SNA and non-SNA components. IBM has since been engaged in defining and publishing details of this architecture.

IBM's network management architecture is based on three network management entities: a focal point, an entry point, and a service point. Figure 1 is a high level representation of these entities and the relationships between them.

A focal point performs centralised network management. It sends operator or program commands to the entry and service points, receives management data from them, and processes this data.

Acts as slave

An entry point is an SNA node which provides network management support for attached devices, as well as SNA network connectivity for them. It acts as a slave of the focal point, obeying commands from the latter, and transmitting management data to it.

A service point provides network management support, but not connectivity, for devices which may be directly or indirectly attached. Like an entry point, a service point acts as slave of the focal point, obeying commands issued from the focal point and transmitting management data to the focal point. The service point's primary function is to convert between the SNA management formats and protocols recognised by the focal point, and the non-SNA management formats and protocols used by the attached non-SNA devices.

An entry point is usually part of a standard SNA network, and its main role is that of SNA communications. A service point, on the other hand, is added to an SNA network specifically to provide management support for non-SNA devices. It emulates an SNA node for the purpose of communicating with its focal point in the SNA network.

To make these abstract concepts clearer, let us look at an example of an implementation of these entities, illustrated in Figure 2.

IBM's 3174 cluster controller is an example of an entry point. Its primary function is to attach 3270 series terminals to an SNA network. But it also contains micro-

(Continued page 8)

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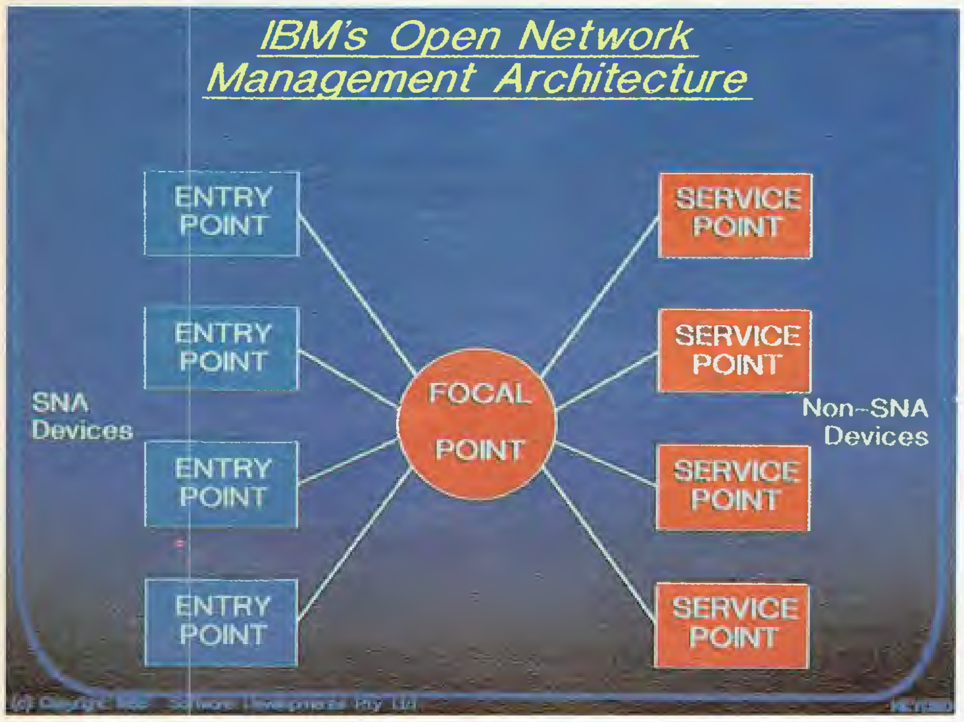

■ *Fig 2: Implementation of the three entities — a focal point, an entry point and a service point — on which IBM's architecture rests*

Multi-vendor nets

(Continued from page 7)

code to provide support of the SNA network management architecture. Similarly, a 3270 series cluster controller from a Plug Compatible Manufacturer (PCM), such as the Memorex 2374, is also an entry point.

Another example of an entry point is the SNA Hub from Netlink. This is an SNA device that acts, in its primary role, as a concentrator of 3270 series cluster controllers. It also implements network management functions that conform to the IBM network management architecture.

A further example of an entry point is the SNA Gate from the same company. This protocol converter for asynchronous terminals emulates a 3270 series cluster controller. Again, the microcode implements network management support for the attached devices.

In fact, neither the asynchronous terminals attached to the SNA Gate, nor the 3278 and 3178 terminals attached to cluster controllers are SNA devices. But from the point of view of SNA connectivity, they are seen by the host as SNA devices on the SNA network.

In contrast, devices managed through a service point are not provided SNA connectivity by the service point, and are therefore not seen as SNA devices by the host.

There are no products on the market that implement the service point concept, as defined by the architecture. One vendor has a PC-based product that is sometimes incorrectly described as a service point. But the product only accepts SNA-format network management data and does not carry out the principal function of a service point as defined in the architecture, namely conversion between SNA and non-SNA formats.

Net/Master from Software Developments is an example of an implementation of a focal point. It accepts SNA format management data from entry points (and hypothetical service points), and provides centralised processing of this data, and control of the network.

Working together

As the diagram illustrates, IBM's network management architecture allows hardware and software from different vendors to work together in an SNA-based network. Compatibility is ensured by use of the same IBM protocol for network management communications. IBM originally used a range of different network management record formats. But as part of its definition of a network management architecture, IBM standardised on a single record format as its protocol for network management data transport. This record, the Network Management Vector Transport (NMVT), has a format that is well defined in the relevant IBM protocol specification manual.

The architecture is defined in conceptual outline in terms of three entities as noted above, and defined formally in specifications of management services and of the standard communications protocol.

IBM's network management architecture divides network management into four categories of management services:

- Problem management;
- Performance and accounting management;
- Configuration management; and
- Change management.

The architecture is still evolving and full specifications of these areas have still to emerge from IBM. Problem management is now the most well-defined category. It is defined to comprise five sub-categories, of which the first two have been specified. Performance and accounting management is defined to include seven sub-categories, of which one has been specified. Configuration management and change management services have not yet been defined at all.

The IBM management architecture works well for a pure SNA network. The management concepts of focal points and entry points are well matched to the hierarchical structure of the SNA communications architecture. Centralised management of a pure SNA network can be performed effectively and efficiently at a focal-point System/370 host.

But as noted earlier, networks are becoming increasingly heterogeneous. Along with this comes a tendency for networks to be organised on a peer basis. Figure 3 is a logical representation of the network of the future. The "network" is a linked set

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need a peer basis

of IBM and non-IBM networks. Equipment is selected on the basis of its being able to best perform a major application function. Peer connectivity and data exchange is required across networks.

IBM's management architecture is rigidly hierarchical and requires non-SNA communications devices to be managed through a service point that is a slave of the focal point. This means that each of the user's non-SNA networks becomes a downstream slave of the user's focal point host, controlled through an intermediary service point. It seems quite inappropriate to attempt to impose such a hierarchical network management system on the networking environment illustrated in Figure 3. The benefits of peer heterogeneous networking would be lost, which, in turn, would defeat the purpose of setting up the heterogeneous environment.

Peer heterogeneous networking requires peer network management. That is, it requires a capability for heterogeneous network management elements to be able to function co-operatively without depending on a centralised control point.

The major computer vendors have become aware of the critical importance of network management, and all of them have network management products in various stages of development and usage. Thus each of the networks shown in Figure 3 will have a native network management system. In this situation, end-to-end network management can best be provided by these individual network management systems working together on a peer basis.

This suggests a model for network management, that is illustrated in Figure 4. The linked set of heterogeneous networks is seen as a single network. Network management services for this network are provided by a number of network management servers. These services are accessed through network management stations.

Network management servers perform problem management, configuration management, change management, performance and accounting management.

Network management stations provide integrated access to all management services.

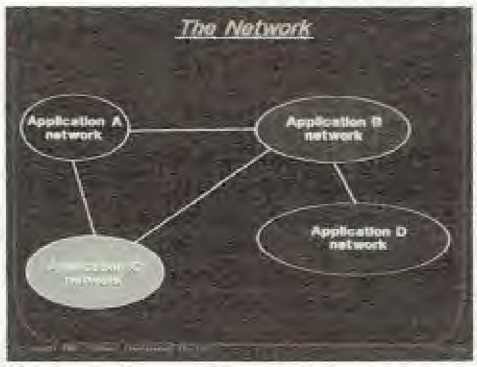
Logical, not physical

Stations and servers are logical, not physical entities. Thus a single "box" may contain both a server and a station. On the other hand, it may take more than one box to implement a server or a station. For example, a station may be implemented as a 3270-type terminal with host-based presentation software.

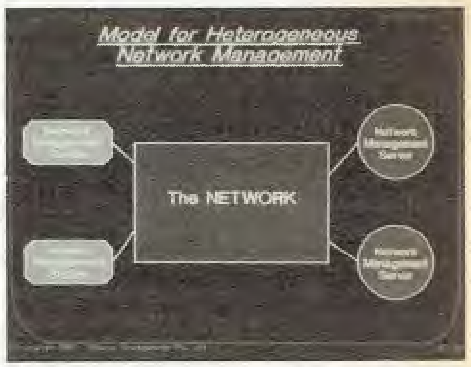
The network management servers communicate with each other as peers. They therefore need to employ a peer communications protocol. Servers may reside in different sub-networks, each with its own communications protocol. What is therefore needed is a high level protocol for management information, that can be efficiently layered over a variety of native communications protocols. The latter can be regarded as reliable since they are used for communications within each individual sub-network. Hence the management protocol need not employ communications error detection and correction. Servers need to set up bi-directional sessions with each other, to communicate information on problem management, change management, configuration management performance and accounting management. A full duplex protocol that supports multiple dialogues is therefore required.

IBM's NMVT management protocol is specially designed for carrying information between entry points and focal points and not for the desired peer functions, such as setting up dialogue sessions. At first sight it might seem that LU6.2 would be a good candidate. But its half duplex nature and inability to support multiple dialogues present strong arguments against its use. In the long term, the OSI standardisation process may produce a suitable protocol; a special purpose protocol will be required till this happens.

A user organisation can choose to set up the servers so that only a single one is visible to users of management services. The other servers still perform their regular functions in the background. The selected server communicates with them using the management protocol, and can therefore provide the users with all management services.



■ *Fig 3: Hierarchy is inappropriate*


Model for Heterogeneous Network Management
The NETWORK
Network Management Server
Network Management Server

■ ***Fig 4: Model for network management***

The peer architecture allows the user organisation to set up fully distributed network management where all servers are visible, or (the appearance of) fully centralised management where only a single server is visible, or an intermediate configuration.

The IBM architecture is a subset of this architecture. An IBM network management focal point represents a network management server. In this architecture, the focal point would have support for the peer management protocol added to it. It would then be able to communicate on a peer basis with other servers, that are implemented on non-IBM equipment and that manage non-IBM devices or networks.

The management of heterogeneous networks needs to be based on a coherent set of rules in order to be effective. But for the benefits of heterogeneous networking to be achieved, it is important that these rules not be rigid to the point where they preclude the most effective use of the equipment being managed.

● *Joseph Fernandez works in the research division of Software Developments.*

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AS/400: the 360 of the next decade?

SPECIAL TO COMPUTERWORLD

Roger Clarke has a look at IBM's new wonder drug

IT'S much easier to know where you are, if you start by looking at where you have come from. In thinking about the AS/400 I am therefore going to start by reviewing a little history. It is well chronicled that when increasing density of integrated circuitry spawned the microcomputer, IBM tried to ignore it. When it launched its first unexciting PC, the product's mere appearance guaranteed the success of the already well-established PC market.

IBM's purpose with the PC was to ensure that in all three segments of the interconnected computing world there was pressure to buy its product. The mainframe market was already predominantly IBM-dictated, SNA had established the communications framework, and the IBM-PC was intended to ensure the company's dominance at the network peripheries. The PC division could afford to be a low-margin operation, provided it did not make significant losses, and ensured that buying decisions remained heavily biased toward the Blue alternative.

■ *The six-member Application System/400 family*

■ *Roger Clarke is a reader in information systems at the Australian National University*

Problems with commodities

However, two things went very wrong with the plan. The first was that, although IBM quickly replaced CP/M-based 8-bit machines as the standard, the PC became, and the PS/2 is quickly becoming, a mere commodity. In a commodity market, entry is easy, prices stay down, and there is no prolonged period of protected market where high contribution margins enable R&D and market development costs to be amortised, and the cash cow milked.

There also tend to be unwelcome perturbations, as small operators carve out short-term local monopolies, and unstable competitors sell off stock at below their own cost price. On top of that, commoditisation prevented IBM from keeping more than half of the PC-compatible market.

The second problem for IBM was that the three-pronged attack was undermined by the maturation of the minicomputer. For some years now, the market has been characterised by three levels (mainframe, mini or midrange, and connected device), connected by two levels of communications (wide-area and local-area).

In addition to a wide variety of output apparatus, the connected device arena has moved beyond terminals and PCs to include workstations with more Mips and storage, high-quality, bit-mapped graphics and high bandwidth to fast networks. Mainframe and mini have been joined by multi-user supermicros, and those architecture-based terms supplanted by more usefully descriptive ones like data-server and process-server. All this in just five to seven years.

Although increasingly dominant in the large-processor marketplace (or at least in that large segment of it which is concerned with high transaction volumes), IBM has never successfully competed in the midrange.

During the past decade it has ceded the field to DEC's Vax range, and its competitors such as Prime, HP and DG. Those conventional minis have been joined by a host of Unix machines like Pyramid, with hardware architectures derived as much from the micro as the mini era, and some closely coupled multiprocessor machines like the Sequent.

The reason IBM has failed to protected its midriff is that when integrated circuitry spawned the minicomputer at the close of the 1960s, IBM's mainstream spurned it. It was left to the office products division, the guardians of the once-ubiquitous Selectric typewriter, to produce IBM's mini. The intriguing thing is that the System/3 of 1970, one of the blackest of IBM's black sheep, is the ancestor of the newly announced AS/400 series.

"IBM's worst-kept secret", as the salesman delightedly called it, was announced on June 22 with worldwide flourish. At least, that was when it was announced to the great unwashed. Some 1500 user organisations around the world have apparently been enjoying beta-testing the machine, ensuring that the rest of us receive a substantially debugged machine.

This article is a review by a commentator with not a little bigotry and bias, and it is as well that bias and bigotry be explicit. I have been a long-term critic of mainframes in general, and IBM's in particular. Of their human-unfriendliness, of their heavyhandedness, their ever-increasing layers of systems software and terminological complexity, and their insatiable appetite for support staff and for housekeeping Mips.

I have also been a serious critic of the attempt to inflict the 370-series nightmare on the midrange via the 9370. I went on record soon after its release to say that even if it were to prove attractive to large American corporations as a departmental processor, it was irrelevant to Australia's needs.

The failure of the 9370 to penetrate the Australian market has shown that we agreed nearly unanimously on that point. On the other hand, I have been a long-term fan of the System/38, with its far more human face, and data administration and DBMS capabilities embedded in its operating system. It is no darling of the computing science whizz, based on a mixed-up language as it is. But used properly, it can be very effective.

Market manipulation

I have also been critical on occasions of IBM's manipulation of the marketplace (such as FUD to undermine competitors, "no-one ever got fired for buying IBM" to encourage timid DP managers, and visits to the finance director to undermine self-confident ones). Admittedly, at the same time I have been even more critical of IBM's competitors for allowing it to become so dominant in computing matters, simply by following the essential tenets of the free-enterprise system with more conviction and more consistency than anyone else. The mostly negative pre-disposition I bring to matters IBMish should be borne in mind as you read these comments.

The first thing to be said about the AS/400 launch is that the company overloaded it with symbolism and cute entertainment. We were assured that the development team worked hard, because in Rochester, Minnesota (near the famous Silver Lake — geddit?) "it's so cold in winter it's more attractive to stay inside where it's warm". As if anyone would really believe that a serious product can be produced in a four-month winter. . .

And that other leaked codename, Olympic, was worked to death with repeated images of such things as the UK's black decathlete, Daley Thompson, pole-vaulting. (Was this meant to be a multi-dimensional appeal to the ethnic vote?) The electronic music was hackneyed, and the less said about Julie Anthony and Stingo singing to the same up-beat Coca-Cola Muzak music the better.

In between the entertainment, IBMers read their carefully prepared lines, and flashed past us the professionally prepared and carefully overloaded visuals. These left us all bloated with semi-meaningless but obviously very important information, and duped us all into looking forward to the next entertainment slot.

So what can be discerned about this new wonder-drug? Is it a 370/115, 8100, PC/3270 or 9370, awaiting consignment to oblivion, or another 360 or SNA, about to take a vital place in IBM's and the whole industry's history?

The hardware design certainly seems impressive. For those who understand such things, the multiprocessor design features IBM's high-density memory chips using Fet Dram technology, VLSI logic using Cmos II technology, a 32-bit data path, and 48-bit addressing.

Six models have been announced, in

(Continued page 12)

Assessing the new wonder drug

(Continued from page 11)

two different casings, and bearing a remarkably coherent numbering system. (No doubt that aberration will be corrected shortly). Software is claimed to run without change on any model.

The smallest model (9404 Model B10) is contained in a compact, under-the-desk cabinet, and is field-upgradable to the second model. Unlike so many of IBM's entry point configurations, it looks sufficiently useful that it might even get delivered. The four larger models (comprising the 9406) use multiple buses, and are mounted in between one and five cabinets, each the size of a four-drawer filing cabinet.

Power requirements are standard 240-volt supply for the two smaller models, and single-phase 240-volts for the larger models. An office environment (that is, mediocre air-conditioning) is good enough, although the presenter suggested that many organisations may wish to place the machine in its own room for "security reasons" (like not wanting to drown the workers in halon gas every time the smoke-detector catches out the naughty person having a puff behind the partition?).

Only 15 minutes are required to instal and bring up an AS/400, because no system generation is required, and configuration is automated. In other words, the hitherto standard IBM feature of having to close down the service in order to reconfigure I/O devices is no more. Better still, the machine appears to be able to examine its own innards and limbs, and prepare and run its own configuration procedures.

So IBM computers have finally caught up with networks, which have been doing the same for some time! To stop being sarcastic, this is a very important forward step, particularly in a country of predominantly small businesses like Australia. For more complex circumstances, the tables of defaults are externally visible to, and modifiable by, the system administrator.

The range of power between the top and bottom of the range is claimed to be a factor of 50, but this claim is very confused and confusing. It could be based on the argument that between four and 200 active users can be supported (assuming you accept the company's assertion that the smallest model, at about $65,000 for a workable configuration, is cost-effective for four users). Yet elsewhere the company claims that the 50-fold performance difference applies only to the four models of the upper (9406) range.

If it were based on the more reasonable criterion of claimed performance when running the Ramp-C benchmark, the performance span would be only about 7.5. But then the factor is a rotten measure anyway, open as it is to manipulation.

It is preferable to understand and use the Ramp-C benchmark, measured in IBM's traditional "number of active commercial users", or the equivalent, and I think more readily understood transactions per minute (see Figure 1).

■ ***The model B60 'brings business solutions to many industries', according to IBM***

The disks are 630M-byte or 945M-byte 5¼in spindles on the 9404 models, and 855M-byte drives on the 9406s. Channel speed for the 855M-byte drive is 3M-byte/sec, but no indication of access speed was given for either device. Support for most existing System/3X terminals, printers and disk drives protects much of the user-base's existing investment.

On IBM's assumptions, the AS/400 provides an effective entry point about or below the bottom end of the existing System/36 range, and a (current) upper end overlapping into the 3081 range. The B50 is marginally more powerful than the current System/38 top-of-the-line Model 700, and the B60 offers 70 per cent more on top of that, which should stave off the most processor-limited users' capacity problems for a while at least.

> ‘ The first thing to be said about the AS/400 launch is that the company overloaded it with symbolism and cute entertainment ’

The future of the existing midrange machines is unclear. The System/36 Model 5363 has been enhanced at the same time as the AS/400 release. It is marginally less powerful than the new AS/400 entry-level product, the 9404 Model B10.

However, nothing has been said about the Series 1, PC-RT, 51XX, 8100, System/23, System/32, System/34, System/38 and the other models of the System/36. The 9370 and 4300 are also considerd by IBM to be part of their midrange offering.

Figure 1: IBM's AS/400 Range

	9404		9406			
	B10	B20	B30	B40	B50	B60
Active Commercial Users (IBM Ramp-C)	28	40	53	80	119	200
Trans. per min.	105	150	199	300	446	750
Equivalently powered S/36 models	5363	5360D	—	—	—	—
S/38 models	38/100	38/200	38/300	38/600	38/700	—
Memory (MB)	4-8	4-16	4-36	8-40	16-48	32-96
Max. Disk (GB)	1	1	7	7	13	27
Comms Lines	1-8	1-8	2-16	2-32	2-32	2-32
Local Workstations	40	40	120	200	320	480
Token Rings	0-1	0-1	0-2	0-2	0-2	0-2

Naturally in a tightly controlled launch, the last thing you get to do is use the thing. But just to prove I can quibble with the best of them, the fan noise emanating from the Model B30 10 metres from me, was starting to get annoying by the end of the session. To be fair, if I was sitting doing nothing but stare at an audience for an hour-and-a-half, I might get cantankerous too.

The presentation claimed that the System/3X user base of 300,000 worldwide and 3000 in Australia had told IBM that their most crucial requirements were ready-made applications and ease of migration of existing custom-built software. It is therefore appropriate to discuss these matters before embarking on a Cook's tour of the product.

To satisfy the need for packaged application software, IBM has worked with its associated software houses ("business partners" in current parlance), and claims to have 250 packages available at launch (including 20 Australian products converted at its North Sydney premises in May and June), with a further 450 planned by the end of the year.

For its own part, IBM has announced a version of its own financial system Imas, with some modules available 3Q'88 and others in 1Q'89. It has also promised OS/400 Office. Or has it delivered OS/400 Office? The language has been so debased by salesmen (not just from IBM) that I tend to be sceptical about the word "is".

Office offers/will offer Displaywriter-based WP, and multiple language dictionaries and proof-reading aids. It also includes mail, personal (and also shared?) calendar, personal directory facilities, and access to electronic document distribution facilities based on DCA/DIA and (later?) Snads. The existing menu-driven Query product, intended only for casual users, has been enhanced.

The existing PC Support product is also available on the AS/400, enabling data interchange between midrange and micro, and use by the PC of the AS/400's disk storage much as if it were a directly attached disk. Menus on the PC can offer a mix of processes, some of which will run on the PC and others on the host to which it is attached, without the user being aware of any difference (other than perhaps response time).

It is not clear whether processes on some other server on a local or wide-area network will be able to be similarly invoked (what IBM refers to as Display Station Passthrough). As always, a conservative assumption is appropriate until and unless a clear statement is made.

The extent of the support for graphics is limited at this stage to the generation of business presentation graphics and their incorporation in text documents. The machine is claimed to have the capacity to later support 64-bit addressing and thereby enable some kinds of image processing in the future.

Many organisations are moving beyond mere presentation graphics, to use general-purpose diagramming tools, Case and iamge storage and management. Cad/Cam and its ilk need not run on the same machine as an organisation's commercial and administrative applications, but high organisational effectiveness and productivity demand seamless interchange of data, whatever its form.

The ease of migration of existing software was of course what made the impressive list of packages possible. My long-standing prediction had been that the new series would involve VM as host operating system, with a variety of possible guest operating systems, especially System/36 and System/38 emulations, a native operating system designed to migrate System/3X toward 370-series operating systems, an OS/2 emulation, superset or companion, and a promise of restricted VSE, AIX and/or MVS versions.

Long-term I may not have been so far from the mark, but at face value I was wrong. There are three modes of operation, or "operational environments", one native and one each for the two existing System/3X lines. It is not stated what the pedigree of the native mode is, but it seems to be more like a descendant of the System/38's CPF with some VM features than son-of-VM.

IBM has accumulated experience both overseas and in Australia in migrating System/36 and System/38 applications, and migration aids are available. It would appear that System/38 applications which were even moderately cleanly implemented should move to the AS/400 very easily indeed.

System/36 applications should move with far less heartburn and cost that used to be attendant on such activities (such as, to the System/38). Physical transfer may use any of several alternative media. The smaller and/or older installations in particular will encounter some difficulties or expense in this regard.

The efficiency of the non-native modes is unclear so far, but the industry has learnt much in the past 20 years about emulation of old instruction-sets, and the physical machine is now powerful enough to support multiple logical machines (dare I call it virtual architecture).

So if the right elements are in microcode, the efficiency penalty for running old applications should be quite bearable. No data was provided at the launch, but the trailblazers will doubtless learn quite soon.

System/36 applications require preparation and re-compilation. System/38 applications are (mostly) a case of save and restore, from which it is reasonable to infer that the AS/400 is object-code-compatible with the System/38, not only for processing code, but also for CL procedures, data schemas and screen and print formats.

(Continued page 14)

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Assessing the new wonder drug

(Continued from page 12)

One very positive aspect is that an application may use functions from any of the three operating environments. Existing applications may therefore be progressively migrated, rather than having to be converted in a single project. In short, IBM has taken great care to provide a support framework for its existing client-base.

It is impossible to consider any strategic IBM product without carefully relating it to Systems Applications Architecture (SAA), announced in March 1987. SAA promises a set of consistent environments in each of the OS/2, OS/400 and VM/MVS environments. Judging by the lack of action until now, most of we sceptics have felt justified in anticipating the delivery of SAA-compliant environments around the turn of the century.

Well, the shape of SAA was one of the factors which had convinced me that the new machine would be VM-based. SAA, as originally announced, and for 15 months little modified, did not feel like a System/3X environment.

Of course, this could have been a classic case of IBM throwing the opposition a red herring. On the other hand, the June 22 presentation include the words "We've added RPG to SAA — we've been listening to you". So perhaps they just changed their minds.

So now, SAA's Common Programmer Interface is to include RPG (and also its Common Communications System is to include the System/38 DDM). However, "SAA RPG is (that is, will be?) based largely on the IBM RPG III language implemented on the IBM System/38", which means that it will not be entirely compatible with any existing RPG. Significantly, IBM is converting its own Imas into System/38 RPG III, not directly into the new native code.

Intriguingly, the presentation claimed that the AS/400 is the first system "to fully meet (the SAA) standard". Now ISO OSI never claimed it was a standard, merely a framework, within which a set of (international, multi-organisational) standards could be conceived and developed. SAA is similar in that it is not in any sense a standard, but an umbrella for a set of standards (although in this case international, single-supplier).

Yes, perhaps a few of the components of SAA are well-specified and standard products (it's very hard to tell, given the vagueness of the March 1987 documents). But most of the commitments in SAA are to be "based on" products like REXX, CSP, SQL and GDDM, rather than being those products.

And the standards will not be a "set" until they have all been revised or redeveloped to comply with common user, programming, communications and data interfaces. In short, the "product" still falls far short of the rhetoric.

I continue to applaud SAA as a statement of direction, and consider that many of the right products have been chosen as the basis for future development. But I continue to criticise its close-endedness and its vagueness on many key points, and am not going to hold my breath awaiting specification of the components, or delivery of compliant products.

Meanwhile, announcements of convenience, like the incorporation of RPG and DDM, make clear that SAA is a purely marketing notion, intended to give the company's wide range of disparate products an appearance of familial relationships, but entirely lacking the enormous insight and technical contribution of SNA.

A feature which was very prominent in the launch was the machine's sub-second response time. Interestingly, the detailed graphs suggest that the machine has been optimised to deliver precisely that across a wide range of load, but to then degrade dramatically. The steep degradation curve is presumably a result of the multi-processor architecture. Image-swapping seems less likely, since all code is re-entrant.

Personally, I remain unconvinced that sub-second response is actually a critical feature. Too-prompt responses startle any but the most skilled and quick-thinking computer-whizz, and hinder organisational productivity as much as they help it.

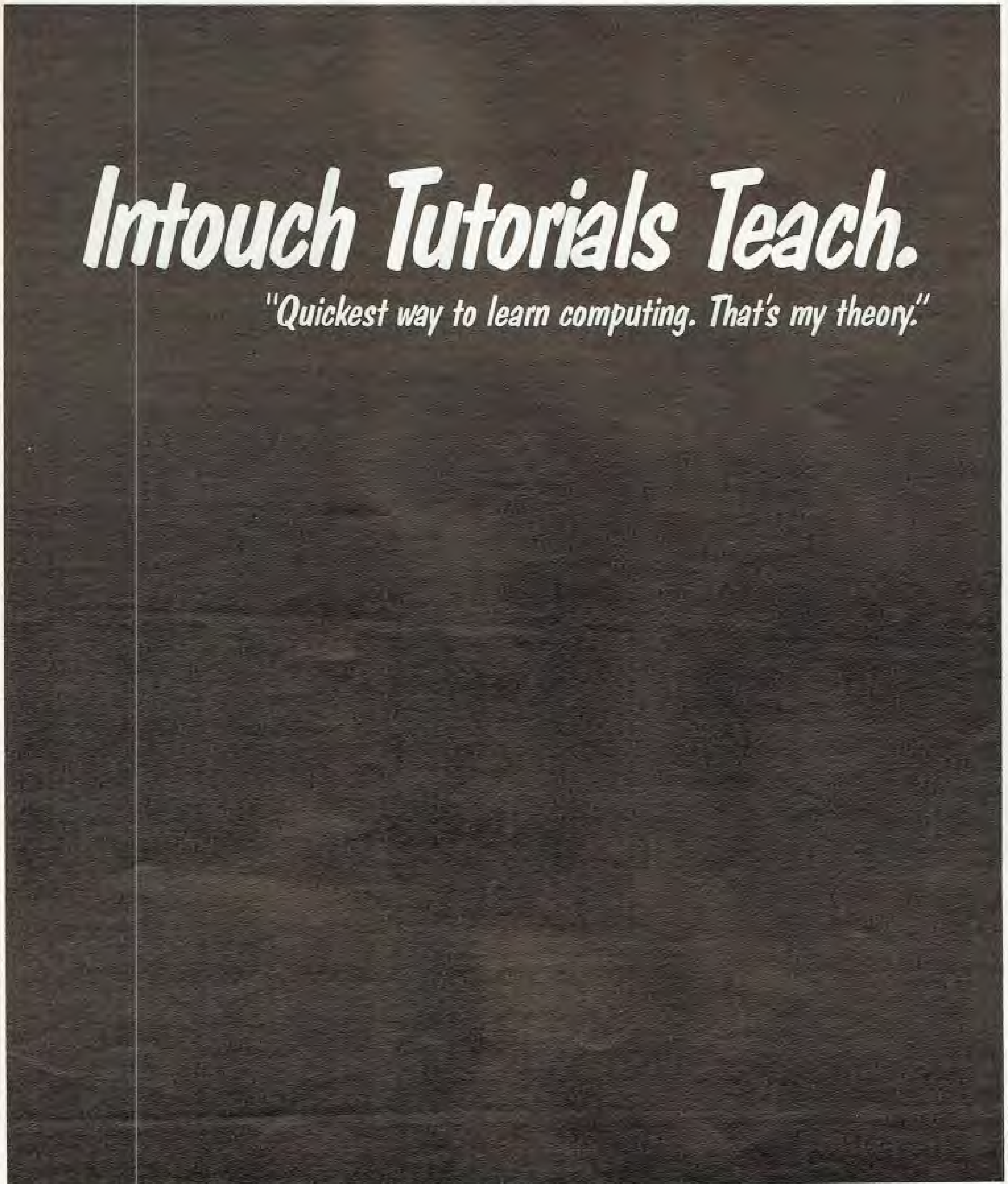
I interpret this new buzz-phrase as another brilliant piece of marketing communications, of the same order of brilliance as James Martin's completely unhelpful yet seemingly all-encompassing concept of backlogs.

What is actually needed is consistently quick response, say of the order of 1.5 to 2 seconds from transmit to receive, with near-instantaneous screen-fill. Only a dummy like me would try to communicate such a complicated idea — IBM calls it "sub-second response", and everyone says yes! yes! yes!, and buys. Maybe that is why I am in an ivory tower and they are in business.

> ‘ Another heartening feature was that the presentation expressly referred to portability not only of software, but also of programming talent ’

At the marketing level, this sub-second response feature is clearly intended to attack the known problems of mini-computer architectures which degrade more gradually, but all too noticeably. This has been particularly apparent with DEC's Vaxes, whose ever-growing VMS has chewed up ever-increasing amounts of processor and real memory, and actually decreased any given machine's responsiveness under constant load.

The features discussed so far have been abstract constructs, and now it is time to look under the bonnet. The operating system is presented as "a fully integrated set of services". Now that has a certain appeal, in the sense that I would like to ignore what is under the bonnet. Most of the time.



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But an external description of the OS architecture remains important. One problem I set myself was to assess the extent to which third-party tools (particularly 4GLs) and locally developed utilities (that is, security menu systems, and directory management systems) are usable under OS/400, and so far it is not easy.

The word "fully integrated" can also mean closed system or closed shop, and for medium-sized organisations who have significant DP competence, and depend on it to ensure that their IT investment supports their competitive advantage, a closed system may not be as attractive as an open-ended VMS, Unix or Primos system.

In particular, the claim was made that "a truly relational DBMS" is in the hardware, and SQL is within the OS. Anyone who has studied Codd's works knows that "truly relational" is a phrase used casually only by salesmen, never by database specialists. I am happy to go out on a limb and assert that the last word in DBMS is a long way away (I'd even say why, but this article is already too long).

The launch documents also made the all too common mistake of using the term "relational" to apply to the physical level of data storage. All of the relational concepts apply at the logical levels of shared organisational model and application views. What physical techniques are used to map the relations on to a physical storage device (silicon, magnetic disk, optical disk, or anything else), are another matter entirely.

> ‘ A language failing that task but gravitating into the data-handling subset of a professional programming language ’

As regards SQL, I am on record as being highly critical of its design, particularly as an enduser tool. It is increasingly seen as a reasonable-enough "deep language". Front-end query products designed to support particular kinds of users in performing particular kinds of work could usefully generate SQL as intermediate code.

IBM now appears to concur with the view that its use as a query language is secondary. Its overview of AS/400 SQL refers to interactive use of SQL only after describing the use of "embedded SQL".

Embedded SQL enables programmers to access data maintained by an SQL-driven database. It was an accident, not a design-objective, and yet it has become the normal data access mechanism in IBM's mainframe DBMS DB2 and SQL/DS, and is now to become the norm on the midrange machines as well.

We have, therefore, experienced the comical sequence of events of a language designed for interactive query failing that task, but gravitating into the data-handling subset of a professional's programming language.

On the positive side, at least a trained programmer using embedded SQL is less likely to fall foul of the language's traps than is a mere enduser applying it interactively. But where does this leave the question of hardware and microcode implementation of relational DBMS and SQL?

■ ***The IBM AS/400 model B50***

IBM said that "machine performance and resources can be optimised by implementing function within the layer in which it operates most efficiently". This sounds like classic computer scientists' sub-optimisation. Commitment of a feature too deeply creates inflexibility which will inevitably affect supplier, "business partners" and user organisations alike.

Choosing what to embed and what to keep flexible is the real techno-business skill in midrange machine design. We do not yet know whether IBM has chosen well for itself and the rest of us. But I am happy to assert that a contemporary DBMS and SQL embedded in silicon are liabilities rather than assets.

A further reservation about the AS/400's data management is that it is unclear whether a database specified using a conventional System/36 or System/38 data definition facility will be accessible using either interactive or embedded SQL.

Another concern is the extent to which standalone OS/400s are able to co-operate as components of a distributed operating system, and hence support distributed database management. It has been stated that SAA Distributed Relational Data is planned for a future release, that is, is not yet available.

Distributed Data Management (DDM) appears to be applicable only within peer-to-peer networks (that is, among AS/400's and System/36s, with a few additional midrange and lowrange machines like the System/38 as end-nodes). In any case, will that much be available at release date? And when will mainframe operating systems and OS/2 be able to collaborate?

(Continued page 16)

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Assessing the new wonder drug

(Continued from page 15)

I must admit that, when it comes to connecting among the vast range of IBM machines, I try to say very little and leave it to the specialists. At this stage, I am happy to accept IBM's claims, that the AS/400 range provides connectivity without complexity, with only the usual measure of salt.

The communications lines support bisynch, asynch, X.25 (possibly — it is mentioned in some places but not in others) and SNA protocols at up to 64K-bit/sec. The language of computing sales reaches new lows with the assurance that an "integrated Token Ring adapter may be fitted . . ." — if it is integrated, surely it does not need to be fitted!

Properly configured, the machine will clearly function not only standalone, but also as a host for local networks (at least of PC- and PS/2-compatibles). It is explicitly stated that "an AS/400 can be installed in an existing System/36 and/or System/38 network without impacting on that network".

As a node within a System/370-based SNA network, an AS/400 can support 3270 sessions, including CICS, either on 5250 terminals by emulation, or on 3270s attached to it via a 3174 or 3274 controller. System/370 RJE is available, and using RSCS/Profs bridge, mail and file interchange among AS/400 and System/370 users is possible.

On the other hand, the extent and nature of the AS/400's compatibility with non-IBM terminals and PCs (particularly standalone Macintoshes), with existing corporate SNA networks (particularly those including non-IBM nodes), with Appletalk- and Ethernet-networked Macintoshes, and with workstatons (such as Apollo, DEC Vaxstations, IBM-PC/RT, Mac II and Sun) should not be blithely assumed.

At what I refer to as the Access Level, OS/400 supports traditional tailorable menus with mnemonic fastpath, and formatted screens. In addition, a natural language help system is available, presumably in addition to an unnamed but conventional command language.

Nothing was said about direct support for Wimp interfaces, suggesting that users of terminals, PCs and workstations will continue to have very different working environments for some time yet.

However, there was an interesting comment that "multitasking on PCs is to be supported from OS/400", suggesting that individual users may be able to make more effective use of multitasking, as they can on mainstream minicomputer command languages. The now ritual promise was made that voice input was coming "real soon now".

In the still vital area of development and maintenance productivity, the machine promises "an interactive programming and testing environment with interactive symbolic debug and formatted dump". That was where the minicomputer manufacturers were about 1982. The name of the game now is Case — "life-cycle support products" which are as useful to the analyst and designer as the programmer.

Case is often represented as auto-diagramming and data cataloguing for analysts and designers, with some syntax and completeness tests thrown in for good measure, and the promise of auto-generation of schemas and processing code if not yet, then "real soon now". But a mature Case product must be built around much more than a data dictionary, what I refer to as a full-scale "meta-data manager".

Many years ago, the System/38 made a big advance, similar to that which Dick Pick made, by embedding DBMS and data dictionary primitives in the operating system. Unfortunately there is no sign that the AS/400 has matured beyond these mid-1970s insights. A mere data element catalogue, or a central record register, is not a data dictionary.

> ‘ Perhaps I am being unduly bloody-minded, but on the basis of past performance, such scepticism is more often justified than not ’

To have a genuine data dictionary, you must support both logical and physical definitions for both active elements (functions and processes) and static elements (entities, relations and attributes; and data items, records/screens/print formats, and files/datasets); and where-used queries must be answerable for all such elements. It is not yet clear to me whether the AS/400 data dictionary supports the full functionality which was specified as long ago as the early 1970s.

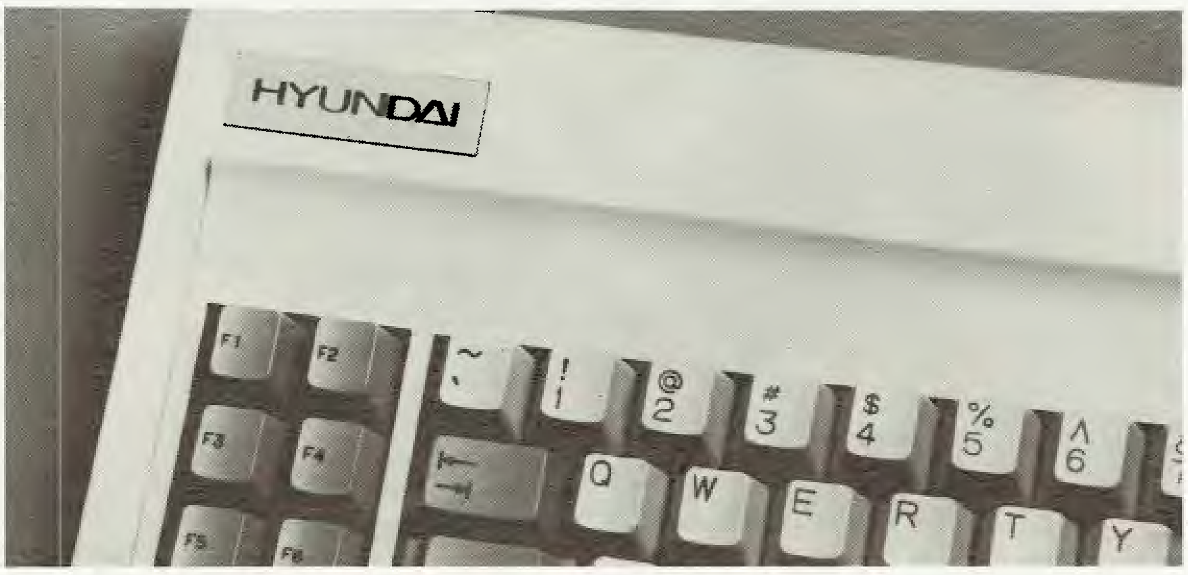
It is also unclear from the announcement what support is provided for managing the large number of forms and versions of the large number of components (process source and object, data schema source and object, I/O formats, compilation and execution OCL/CL procedures, and so on) that make up an application, and software pre-requisites such as systems subroutine libraries and OS utilities.

Configuration management has become a well-defined discipline, and is a mandatory for US DoD tenders. The AS/400 ADT (Application Development Tool) PDM (Programming Development Manager) appears to provide only a very rudimentary capability.

What native command language is available is unclear, since the SAA procedures language, based on the VM product REXX, is not planned to be available for some time yet. On the positive side, it was

(Continued page 18)

More IBM than IBM?



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(Continued from page 16)

Assessing the new wonder drug

stated that all users have command-language transparency available to them, enabling, for example, printer queue inspection and manipulation without having to exit from the current task.

The full-screen editor incorporates some line-oriented commands, and a split-screen capability to enable display of other documents. The editor is also to support syntax-checking "through interfaces to language syntax checkers".

I infer from this that the editor contains the necessary hooks to allow future syntax checking, but none is actually delivered yet. Perhaps I am being unduly bloody-minded, but on the basis of past performance, such scepticism is more often justified than not. Syntax-aware editors are quickly becoming the norm in the minicomputer world.

Other application development tools are a data file utility, a screen design aid and a printer configuration utility. This set of tools, posturing under the grand title of Application Development Environment (ADE) seems to fall far short of a programming support environment of the late 1970s, let alone a computer-aided software engineering environment of the early 1990s.

The AS/400 Office software is claimed to be capable of integration with application software. Hopefully this would enable such capabilities as debtors systems sending decreasingly polite reminders to slow payers, on company letterhead, with names, addresses and salutations automerged.

Another heartening feature was that the presentation expressly referred to portability not only of software, but also of programming talent, at last reflecting a facet of application software technology that some of us have been emphasising since at least the beginning of the decade.

Probably the silliest re-announcement in the package is that the "software architecture relieves the programmer of the job of managing main storage or auxiliary storage". Perhaps I am getting older, and/or the copy-writers are getting younger, but I did believe that we got that out of the applications programmer's hair a long, long time ago. Or is IBM admitting that it had fallen years behind the rest of the market, and that the physical location and nature of program and data storage has until now remained a programmer problem, rather than one for the system administrator? Now that would be uncharacteristic frankness!

Alternatively, the writer may have been trying to explain the system's "object-oriented single-level storage". In one sense that is hardly new for IBM machines, since directory hierarchies were available for years on minicomputers before IBM (and other mainframes) caught up. Now the vogue is once again to store all components in a large flat space. The computer scientists will love it.

But many commercial developers feel comfortable about their objects' names having suffixes which reflect the types of objects (source, executable, compile-procedure, execute-procedure, and so on) that they are, especially since their tools automatically seek out the file with the appropriate suffix (such as, the compile-procedure adds the appropriate suffix to the file-name the developer provides).

Given that the time of programmers and designers is our scarcest commodity, I have yet to be convinced that imposing a heavy naming discipline on developers, which is what a flat space implies, is the right objective.

The SAA languages which the AS/400 "will initially support" (does that mean "at release date" or not?) are the new RPG, a mere subset of mere Intermediate Ansi'85 Cobol, and a mere subset of Ansi/IBM SQL. Non-SAA languages will be Pascal, Basic, and, surprisingly, the dying PL/1. C is planned, and so is an extended version of the 370-series 4GL CSP, and its runtime interpreter.

There is considerable ambiguity about just what is available and when. Embedded SQL appears not to be available for Pascal, Basic or C. All in all, the programming language offering is not terribly exciting for any dyed-in-the-wool software engineer, nor for a boss wanting clever things done. DEC's home territory, the mixed scientific/technical/commercial/administrative installation, may be under threat from Unix, but it certainly is not from the AS/400.

Suppliers of development products, such as the Australian Lamda from Aspect and the British Synon from Strategic Computing, will be immediately usable in the emulated environments. Their developers should not take long to deliver versions running in and for OS/400's native operating environment.

They are therefore likely to be in the AS/400 marketplace with 4GLs long before IBM itself. IBM's record in 4GLs is uniformly poor, and user organisations would do well to assess the available third-party products, rather than await salvation by an IBM product.

On the positive side, subprogram calls are linked by "dynamic binding", from which I infer that preparing and running a procedure, with appropriate parameters embedded or passed to it, to link the compiled images together, is a thing of the past. Good riddance, say we all. It also appears that subprograms may be written in any language which the machine supports.

The launch presentation included a claim that the System/38 was already so productive that Expo's 220-device machine had been programmed by "one manager and four permanent staff". That left some of us sceptics pondering how many contractors had been employed for how long. Meanwhile, one particular member of the audience was pondering why IBM had failed to mention that the software had been developed using his Australian-developed 4GL, Lamda.

Another standard supplier ploy has been to continually re-announce the "don't call us, we'll call you" approach to machine main-

(Continued page 20)

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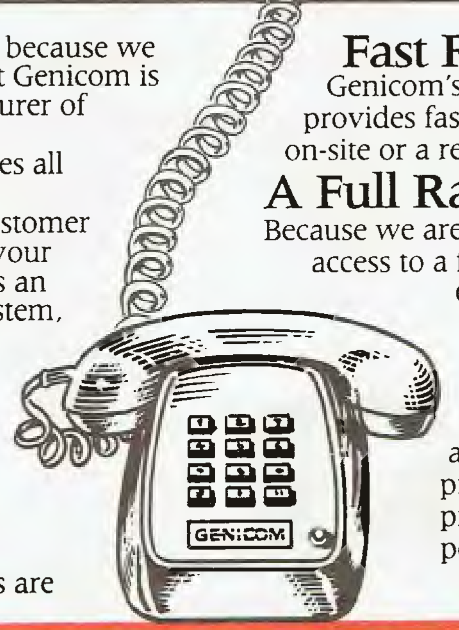

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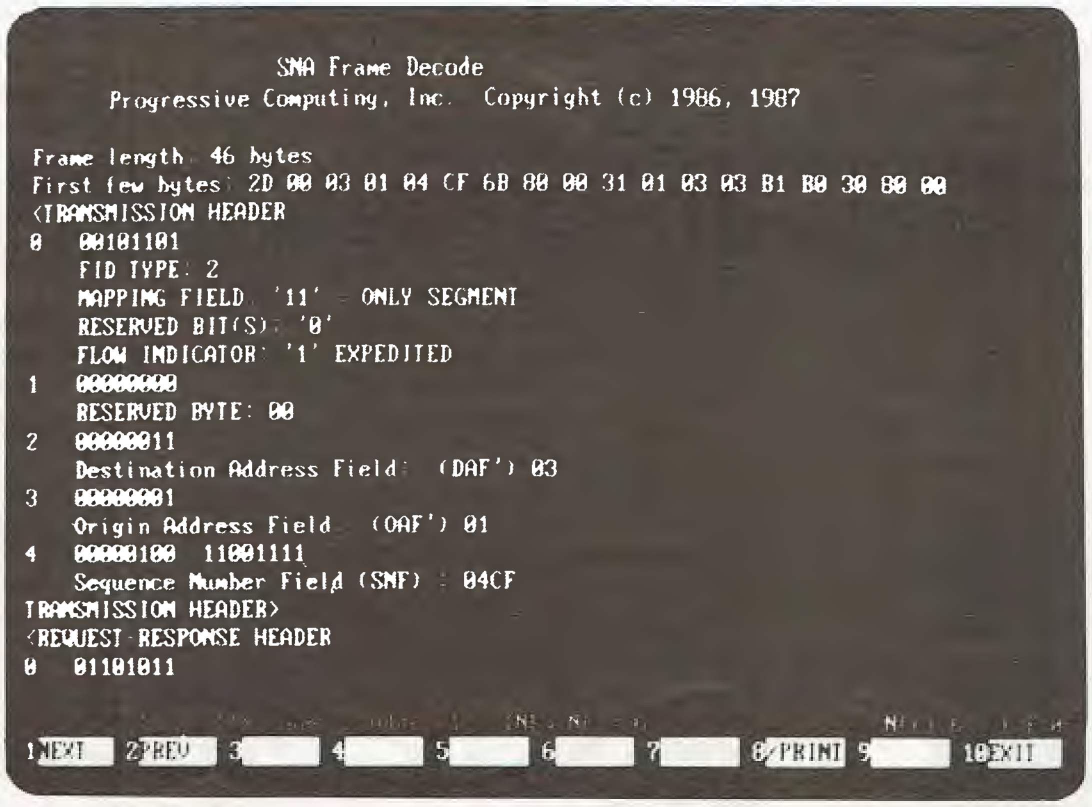

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                SNA Frame Decode
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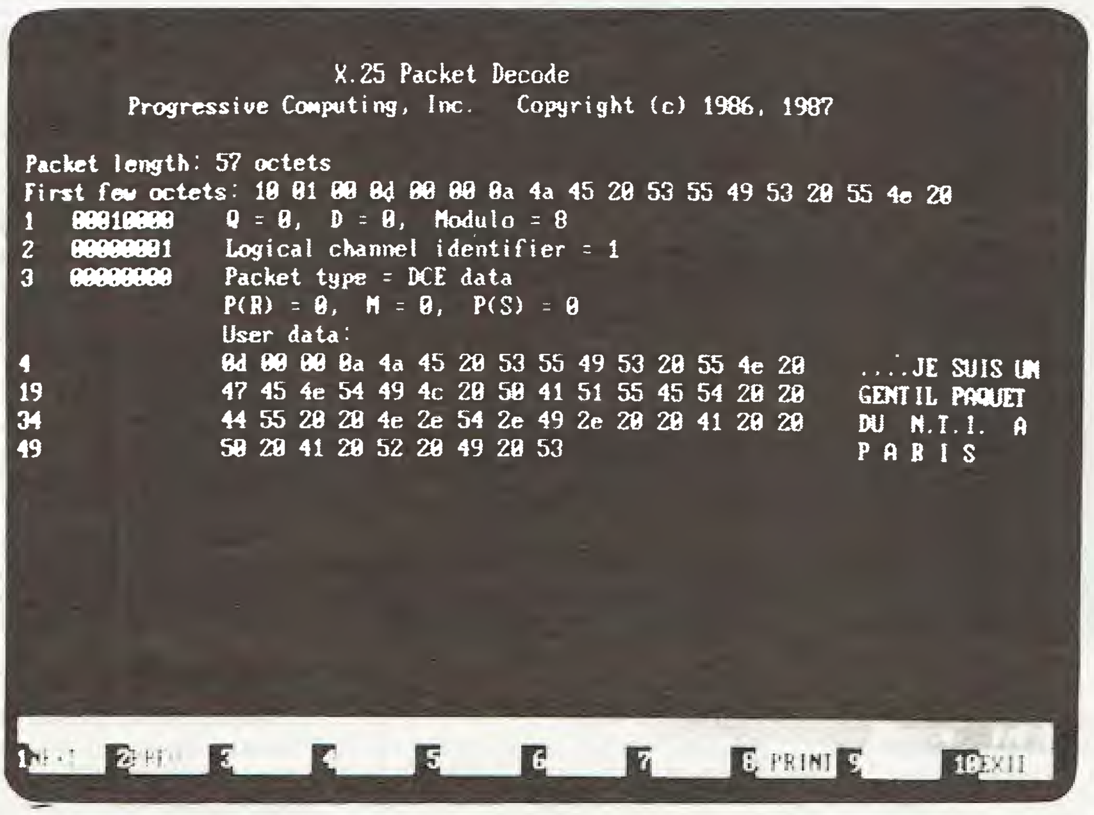
Frame length  46 bytes
First few bytes  2D 00 03 01 04 CF 6B 00 00 31 01 03 03 B1 B0 30 00 00
<TRANSMISSION HEADER
0   00101101
    FID TYPE: 2
    MAPPING FIELD  '11' - ONLY SEGMENT
    RESERVED BIT(S): '0'
    FLOW INDICATOR: '1' EXPEDITED
1   00000000
    RESERVED BYTE: 00
2   00000011
    Destination Address Field:  (DAF') 03
3   00000001
    Origin Address Field   (OAF') 01
4   00000100  11001111
    Sequence Number Field (SNF) : 04CF
TRANSMISSION HEADER>
<REQUEST-RESPONSE HEADER
0   01101011
```

SNA Frame Decode.



```
                    X.25 Packet Decode
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Packet length: 57 octets
First few octets: 10 01 00 0d 00 00 0a 4a 45 20 53 55 49 53 20 55 4e 20
1   00010000    Q = 0,  D = 0,  Modulo = 8
2   00000001    Logical channel identifier = 1
3   00000000    Packet type = DCE data
                P(R) = 0,  M = 0,  P(S) = 0
                User data:
4               0d 00 00 0a 4a 45 20 53 55 49 53 20 55 4e 20    ....JE SUIS UN
19              47 45 4e 54 49 4c 20 50 41 51 55 45 54 20 20    GENTIL PAQUET
34              44 55 20 20 4e 2e 54 2e 49 2e 20 20 41 20 20    DU  N.T.I.  A
49              50 20 41 20 52 20 49 20 53                      P A R I S
```

X.25 Packet Decode.

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Assessing the new wonder drug

(Continued from page 18)

tenance. We have heard for well over a decade that engineers are expensive, and that the machine should self-diagnose, and order its own spare parts and the maintenance call at the same time.

What we hear this time is more convincing, because the AS/400's Electric Customer Support uses a line adapter, modem and communications software which are incorporated in the base machine (bundled even!), and an 008 (local call fee only) number is provided. When the maintenance organisation budgets for these items, I start believing in the service.

However, users should avoid getting too excited about how cheap the service will be until the full facts are made known. It is reasonable to assume that some portions of the service, probably crucial ones, will involve user costs.

The first element of the service is that online queries can be made into an onsite database, and into national and international IBM databases containing AS/400 announcements and technical bulletins, and perhaps later also information about approved third-party products.

This seems to be tantamount to saying "if you can't find your copy of the relevant manual, please access our copy before you interrupt our support desk", which may be no bad thing, from either party's viewpoint.

In addition, screen images may be displayed on a second workstation, local or remote, to facilitate problem-solving. Mail can be exchanged with the support organisation. However, electronic Incident or Fault Reporting appears to be part of an optional additional (and presumably charged) service, along the lines of the Retain system operated for its S/370 clientele.

Another feature which deserves attention is System-Delivered Education (SDE). This comprises tutorial software, dealing with introductory topics, conceptual material and operational education, some including exercises.

These tutorials (cutely referred to as a "builtin classroom") are said to be callable from any point within a live application, enabling users to suspend their productive work while they learn the next step. Ah, the benefits of multitasking.

Context-sensitive help is provided, together with a documentation indexing system which supports synonyms. The authoring software is available to IBM customers to create their own courseware.

With more than 10 per cent of the working population now using computers, effective "interactive documentation" is now a vital requirement of all populist systems. If the tutorial material for OS/400 and IBM's own applications is of sufficently high quality, and the authoring software more approachable than conventional products, then highly desirable pressure will be brought to bear on third-party software suppliers to themselves instal the authoring software, and invest in the full range of documentation their users need.

So, to sum it all up, was the excessive symbolism and cute entertainment at the AS/400 launch really necessary? No, sir. IBM has a well-designed product which preserves the System/38's advantages, catches up with competitors in some areas where their previous products were deficient, and even gets ahead in a few areas.

It has deferred the product's announcement until it is very close to being deliverable, and it has provided marketing documentation, which although occasionally evasive, is of good quality and more readily accessible than usual.

The several serious debits noted above must be weighed against the advantages. In some market segments, I would expect the AS/400 to make no headway whatsoever. In others my first impression is that it will be very competitive.

> ‘ IBM's previous attempts to address the midrange have been either half-hearted or poorly conceived ’

IBM was at pains to stress the cost-competitiveness of its previous midrange offerings, quoting an independent survey which showed five-year "cost of ownership" to be at least comparable to other suppliers, and in most cases at least marginally better.

The effective prices of AS/400s (the company is at pains to stress that list price is not necessarily final price) are awaited with interest. Certainly if IBM is able to be cost-competitive with Unix suppliers, we will see a most interesting head-on clash between software engineering- and business-oriented thinking.

IBM's previous attempts to address the midrange have been either half-hearted or poorly conceived. The AS/400 provides System/34 and System/36 users with an escape path into proper midrange computing, and System/38 users a growth path and some very worthwhile product improvements.

For non-IBM users, the AS/400 represents a genuine competitor with DEC and the other midrange Chaps*, particularly in some market segments. And in the long term, it is conceivable that the AS/400 could be the 360 of the 1990s, sweeping even MVS, VM and AIX from the field. But maybe not until early next century.

- *Roger Clarke had 17 years in the private sector in Sydney, London and Zurich, before joining the Australian National University in 1984 as Reader in Information Systems in the Department of Commerce.*

** With apologies to Wang, Pyramid, DG, Tandem and a number of others, Chaps is of course Convergent, HP, Astra, Prime and Sequent.*

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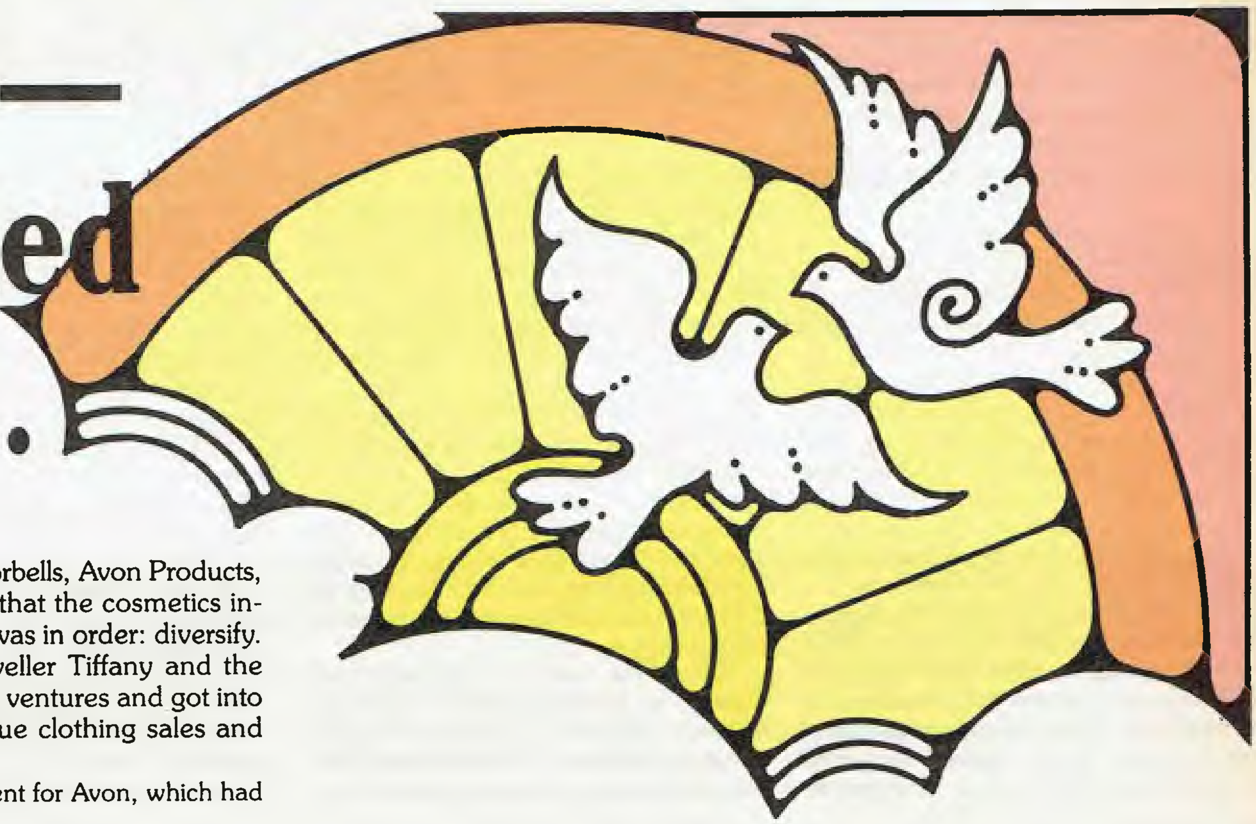
IBM to DEC — and no ruffled feathers . . .



By Glenn Rifkin

AFTER more than 100 years of ringing America's doorbells, Avon Products, the $US3000 million cosmetics giant, discovered that the cosmetics industry had grown mature and gone flat. A facelift was in order: diversify. By 1986, Avon had acquired the prestigious jeweller Tiffany and the medical supply company Mallinckrout, but later sold both ventures and got into the home health care business, nursing homes, catalogue clothing sales and retail cosmetics.

The diversification created a complex computing environment for Avon, which had grown used to an IBM batch processing world. The company, during the past dozen years, had brought in DEC machines for despatch and warehouse management, but the two environments had little need for interaction.

According to Frank Giannantonio, Avon's director of corporate MIS, an order that came in through the IBM system would be teleprocessed to a DEC Vax in despatch and the Vax would ensure that the order got processed and delivered within 24 hours.

Other than that connection, the DEC and IBM worlds were separate islands within the company. But that division of labor has changed dramatically. Avon restructured its MIS department in 1986, creating technical bridges between IBM and DEC.

The latest trend

Avon's DEC-IBM integration simply reflects the latest trend. The integration of both vendors is in various stages of implementation in other Fortune 1000 companies around the US, and the task has raised many questions for MIS.

DEC's growth during the past decade has brought it into a variety of Fortune 1000 environments in which IBM has long been the master. As DEC's departmental Vax solution — a seamless connection across the entire product line — fuelled stunning growth in the past three years, MIS managers began to hear a cry to tie DEC into the IBM mainframe in the data centre. The IBM Personal Computer on the desktop also begged to be tied into this three-tiered model of host, departmental and desktop solutions.

For many MIS managers, the merging of the two environments opens a Pandora's box of issues:

- Are there clean, implementable, technical solutions to the integration question?
- Are there inhouse experts available to address those technical questions or should a systems integrator be brought in?
- Both vendors claim a commitment to emerging Open Systems Interconnect (OSI) standards, but can a company afford to wait for both DEC and IBM to reach all seven layers of the model?
- In many cases, an interim solution to a connection problem has been implemented. Should companies now wait for OSI or put in a second interim solution?
- How do companies effectively merge the two very different cultures without ruffling feathers and losing good people?
- Should organisations stick primarily with DEC and IBM or work with third-party vendors for their solutions?
- How will the clamor over Unix affect everything a company is doing?

(Continued page 22)

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(Continued from page 21)

How Avon links DEC, IBM

The list goes on, and MIS heads pound as users demand transparent hooks between DEC and IBM at a variety of levels. Most of all, hype must be separated from reality.

"Most companies have to take a very practical look at why they are integrating their data," said Irv Shapiro, president of Irv Shapiro and Associates, a systems integrator. "Not all data needs to be integrated, and not all data needs to be accessible from every terminal. There is a fine line between need and desire. And MIS needs to make good, clear business decisions because you read about it and when it is something you need because it is going to help your organisation. This puts MIS under enormous pressure."

At Avon, the business need for integration was clear. In 1982, Avon chose DEC's All-In-1 package for office automation, and DEC crossed over into the corporate side of the picture. When the company's changing business focus caused the 1986 restructuring, MIS became a corporate function with a small 17-member staff and responsibility for decentralised data centres in the company's divisions. Suddenly, what had been a heavily service-oriented function became a significant business function. The group started with a clean slate and a mission: to provide leadership, innovation and a business attitude to MIS.

In an unusual move, Avon chose DEC rather than IBM as its main vendor for the corporate MIS function. Running a stepped-up IBM system would have required more people than running a DEC shop, and Avon wanted to keep the group lean. Giannantonio saw that integrating the IBM and DEC worlds was essential to the plan's success.

Today, Avon uses DEC Vax-clusters tied together by thinwire Ethernet local-area networks, along with its IBM mainframes, to run the business. Corporate-wide links were necessary to make the system work. In addition, Giannantonio is building an executive information system in corporate headquarters based on the Vax.

In order to link to the IBM world, Avon employed SNA Gateways from DEC and a bevy of third-party software offerings from Oracle Corp, Pilot Executive Software and others. Giannantonio was not intimidated by the task of integrating IBM and DEC technically. The harder task, he said, was to find the right people to run the show. "The staffing profile in a multivendor shop is different from that in all-Big Blue shop," Giannantonio said. Consulting skills were also paramount in order to make clear the corporate MIS mission.

Giannantonio realises the complexities of the environment he has created. But he said it was a road well taken. Relying on more than one vendor increases flexibility, provides a wider range of computing solutions and develops a topnotch staff. "You come to appreciate the value of both vendors," he said. "The benefits far outweigh the risks."

As MIS wades into the integration waters, the risks become more apparent. Knowing whom to believe is the first risk. DEC claimed it has been bringing out IBM interconnect tools for the past 20 years. IBM traditionally declined to participate in the interconnect game, believing itself to be the sun in the computing solar system and that it was up to the other planets to figure out ways to hook to it. But after a few years of tough times, brought on principally by DEC's success in hooking into IBM and offering a cohesive architecture, IBM has softened a bit.

While DEC pushes hard toward OSI standards, IBM moves more slowly in that direction. It is content to retain and build on its Systems Network Architecture (SNA) model and add such wrinkles as Systems Application Architecture (SAA) and OS/2 to the picture. Competitors have no choice but to find ways into the IBM universe via open standards interconnects, proprietary connections and third-party software offerings.

Adding to the confusion is the presence of Transmission Control Protocol/Internet Protocol (TCP/IP), the protocol from the US Department of Defence that connects an estimated 20,000 computers at government research laboratories and universities throughout the US and encompasses thousands of networks here and abroad. This connection protocol is growing in popularity as the wait for OSI continues, and IBM has put its imprimatur on TCP/IP as an interim solution, according to Bob Anderson, manager of telecommunications software product management in IBM's US marketing and services group.

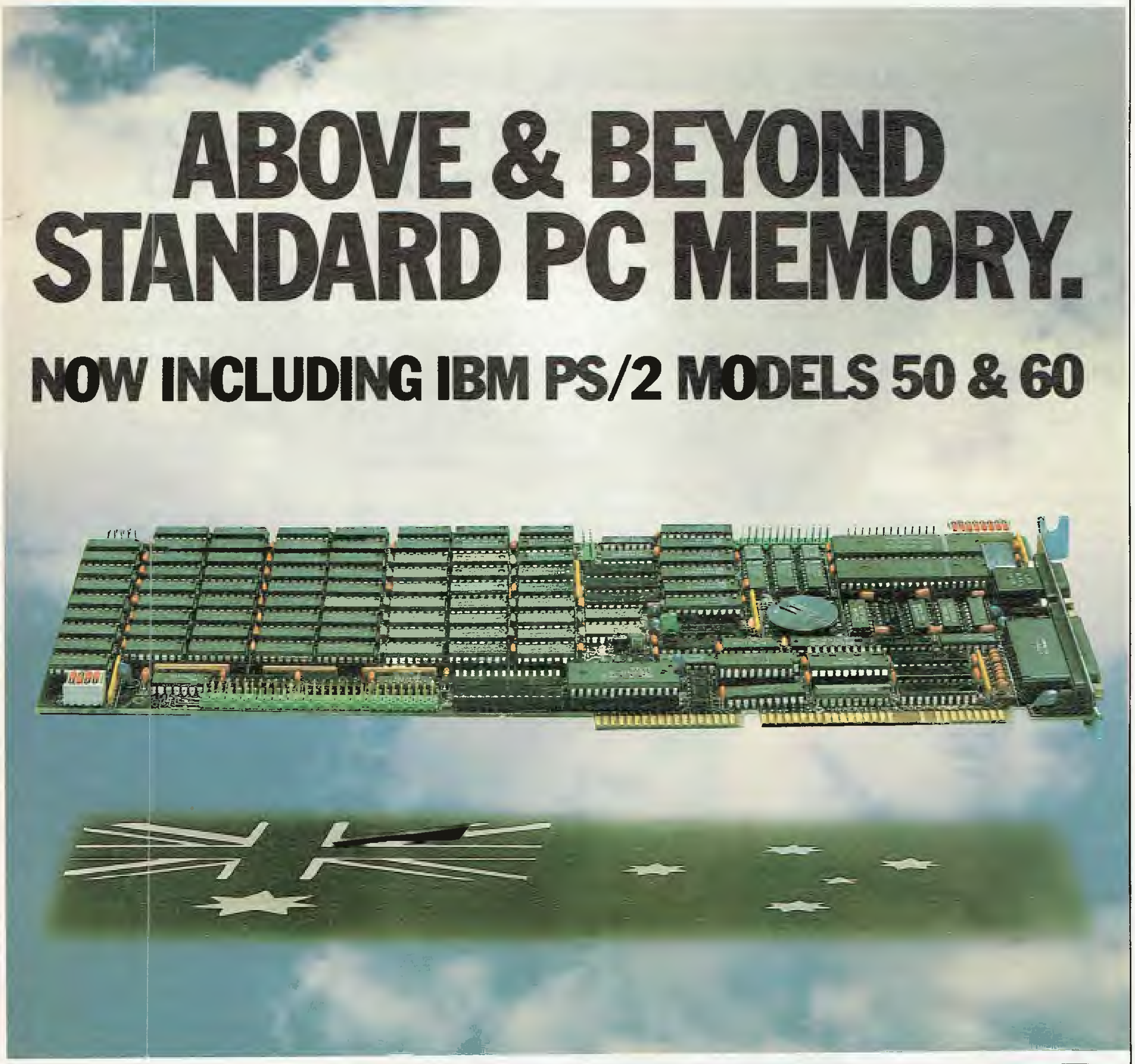
> ‘ Integrating DEC and IBM environments a complex problem ’

Integrating DEC and IBM environments, therefore, is a complex problem. Connections can be made on a variety of levels, depending on the user need and application desired, but a fully integrated, seamless melding of the two environments is virtually unattainable except by the most sophisticated and well-financed companies.

Du Pont and Chemical Bank have implemented innovative and successful integration plans. Jay Wertman, an MIS senior specialist at Du Pont's Charlotte, North Carolina, facility, explains that the company has an electronic mail network that hooks together more than 30,000 DEC users and 12,000 IBM Professional Office System (Profs) users in Du Pont facilities nationwide.

With the second largest Decnet network — only DEC itself has a larger one — Du Pont has furnished e-mail interconnects using third-party offerings from Joiner Associates, Interlink Computer Sciences, and Soft-Switch. The company also worked closely with DEC to create the network. "It is very seamless. A Profs user addresses a DEC user exactly as if it were a Profs user," Wertman said. The system, however, was costly and technically difficult to instal, requiring a lot of home-grown code to customise the connections.

(Continued page 27)



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3Com UPDATE

" The phrase
The Year of the LAN
is no longer in 1988 .... "

**By Michael Duff,
National Manager,
Corporate and Government Division,
Imagineering , Sydney.**

In 1988, the well used phrase,"The Year of the LAN" in the computer industry has become old hat because the PC Local Area Network is today an integral component of the Corporate computing environment.

As a major component of the Corporate computing picture it's potential is unfortunately misunderstood by an all too large sector of the marketplace. Whilst considered to be only one component it is none the less equally as complex as the other "systems" that it complements in providing a total solution.

In 1986 a significant event went largely unnoticed in the computer industry. According to market research statistics from IDC and Dataquest the population of installed PC's surpassed the number of "dumb" terminals. This event heralded the acceptance of the PC as the "universal workstation", a tag now commonly used within the industry.

This transition also confirmed that the PC industry had reached a level of maturity; applications particularly for communications provided sufficient scope and functionality to inspire the marketplace to accept a PC as an all purpose workstation. It could now adequately perform the tasks of both stand alone operation and terminal emulation with the single foot print on the desk now feasible.

The major LAN vendors have been espousing the virtues of bringing the PC's together in a system type environment for some time now and the marketplace has accepted the concept with increasing fervour. The opportunity for resource sharing of applications, information and peripherals is now taken for granted as a worthwhile benefit of all LAN systems.

As the LAN industry continues to develop, the extent of features provided becomes more and more the point of differentiation between competing products. The areas where differentiation can occur are basically restricted to connectivity and network administration/management.

The PC's capabilities in stand alone operation are governed by the imagination of the software developers whilst the ability to extend the PC workgroup into the systems world is a function inherit by today's major LAN vendors.

In extending the PC workgroup several factors need consideration. In developing connectivity solutions LAN vendors were faced with several key tasks. The first was to ensure that an equivalent level of functionality could be achieved from a LAN gateway as could be achieved from the more traditional terminal/host solution. This meant that the functionality required in the device acting as the gateway had to match that built in to the more expensive, dedicated cluster controllers that exist in most mainframe systems.

In the IBM SNA world this meant providing support for a range of emulations including colour and graphics, support for different forms of file transfer, access to High Level Language Application Program Interfaces (HLLAPI) and provision for Remote Job Entry (RJE). An example of one of the more mature products on the market is 3Com's 3+SNA.

The second key task related to maximising the performance of the gateway both in terms of the typical response times provided and in the number of users that could be supported. What we saw arise out of this was a range of solutions. At the low end, developers came up with the PC emulation board with appropriate software that provided adequate performance for a small to medium number of users, typically 8 to 20. The emulation board with its on board processor and RAM could, when installed in the gateway PC, generate enough "horsepower" to drive data transfer rates up to 56Kb/ second.

At the high end companies such as 3Com, through their Bridge Communications division, have developed powerful, dedicated gateway devices that basically replace the cluster controllers and exist as a node on the network. These processors are designed from the ground up as performance gateway devices and typically are powered by a series of high speed processors such as the Motorola 68000. This level of solution supports a much larger number of users with excellent response times regardless of the gateway load. Data transfer rates of 2Mb/ second are a feature of the more powerful of these products.

When considering the issues relating to Network Administration / Management it is first necessary to define this terminology. Network Administration refers to the control of the LAN as an isolated workgroup. That is, the ability to monitor the resources in the workgroup without regard for external systems connected via gateways etc. Network backup, security, resource control and performance tuning are components of network administration.

Mr Michael Duff, National Manager, Corporate and Government Division.

Network Management on the other hand relates to the control of all of the components of the total computing picture. This extends from the PC workgroup to minis to mainframes. From a central point all the resource can be monitored and communication paths and resource relationships can be recognised.

An example of Network Management is IBM's Netview; a tool that monitors resources in an IBM environment. When a multi vendor environment exists however, Network Management systems are struggling to mature.

The reason for this is quite simple; when attempting to communicate data or link processors in a multi vendor environment consideration has to given to the fact that these disparate systems employ differing protocols. Effective, cohesive communication in a multi vendor environment is, in 1988, largely unachievable. In response to this the industry, through cooperation from the major players, has embarked on the development of a universal standard, the Open Systems Interconnection (OSI) model. This model facilitates the creation of a system in which equipment from different vendors can communicate in a seamless fashion.

Critics of OSI and it's potential are scattered throughout the industry. In 1988, however many of the answers to these criticisms have been provided through a number of forums designed to demonstrate OSI connectivity between equipment from the major suppliers. Perhaps the most intriguing aspect of OSI though is the fact that it will eventuate not because of the wishes of vendors or the natural progress of technology. The driving force of OSI is in fact an economic phenomona. In 1992 the European Economic Community (EEC) will be created in full force throughout Europe and the powers that be, in their wisdom, have declared that full certified compliance with OSI will be a prerequisite for vendors wishing to sell their products into what will be the largest market in the world.

So how does this impact Network Management? In 1988, this emerging standard is still very much in the development stage. Consequently in the early 1990's the industry will have to endure the lack of any uniform standards and without them the management of the complete computing facility from a central point is basically unachievable. One of the major driving forces behind OSI is obviously the requirement of multi vendor environments for an effective solution to their resource management. This includes the management of the PC workgroup or LAN. In the consideration of any of the components of the total solution the intended direction statements issued from vendors will unfortunately be the only security that the market will have for future compliance.

(Continued page 4)

Ian Simpson, Imagineering's 3Com Product Manager inspects the bank of 10 3Com /200 and 400 Servers used in the Imagineering Electronic Mail network.

Electronic mail for end users

By Ian Simpson,
3Com Product Manager, Imagineering, Sydney.

To further enhance the contact with our dealers and end users, Imagineering has opened up it's 3Com 3Plus network, making it available to all users at no charge.

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Product and technical support for any of Imagineering's products is now just a few key strokes away using 3+Mail

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3+Mail is an intergrated Electronic Mail Service for IBM PC (and compatables), PS/2 and Macintosh Computers.

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3+Mail allows transparent transmission of electronic mail among dissimiliar workstations - IBM PC's, PS/2 models and compatibles and Macintosh - and across dissimiliar network topologies such as Ethernet, Token Ring and AppleTalk.

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MATTINGLY IMA 136

" Servicing the Outback "

Anyone who was born and brought up in the bush will remember the family sitting down around the mail order catalogue and choosing new clothes and shoes and sheets and toys and... just about anything the Department-Store-in-a-book could provide.

Catalogue shopping is still a very big business in the USA and Europe but almost died out in Australia some years ago.

What killed it? "Mainly the time it took the GPO, as Australia Post used to be, to deliver the goods, collect the money, and return it to the vendor", says Ed Simpson, Managing Director of Personalised Shopping Services Pty Ltd.

"The system was just not efficient enough then", he went on to say, "but Australia Post is very different today, and with widespread credit cards and cheque accounts, better communication systems with toll-free numbers, and better distribution facilities, we can overcome the 'tyranny of distance' that has always made life so difficult for Australians outside the main metropolitan areas. And don't forget there are more and more busy people in the cities who just don't have time to go shopping in person."

Personalised Shopping Services are using the best of today's technology to create a new "Department Store" to service the whole of Australia, in the form of a coffee-table magazine type of mail-order catalogue. They know that they will need to rely very heavily on an efficient computerised order-taking system that is closely linked to their inventory and despatch system.

Which is why Ed Simpson has chosen to install a 3Com 3Server 201 from Data Base in Brisbane to run his custom-designed software, with 3Com 3Stations for each of the telephone and mail order processing operators, "3Com gives us the performance and reliability that we need right now," Mr Simpson said, "together with the expansion capability that means we can never outgrow our system, even when we go beyond our present reach of Queensland, northern New South Wales, and the Northern Territory and cover the whole of Australia with our catalogue."

What attracted Ed Simpson to the 3Com 3Station instead of using conventional PC's as workstations ?

"Even with today's satellite systems, the telephone reception from remote areas can still be less than perfect," he said, "and our business relies on accurate voice communication. A roomful of regular PC workstations is a very noisy place, even if nobody is talking, but as well as being very quick, the 3Station is totally silent in operation, and for us, that is a big plus."

Ed Simpson, Managing Director of Personalised Shopping Services and employee Lorraine Pitkin test out the 3Com 3Server.

Personalised Shopping Services already have Macintosh as well as IBM computers, and the 3Com solution will allow them to integrate all their applications into one comprehensive network, and even provide full remote system administration access for their software programmers in Melbourne. Now that really is overcoming the tyranny of distance!

(Personalised Shopping, P.O.Box 291, Fortitude Valley, Queensland, 4006.)

3Com Dealership Profile

The DATA BASE

specialist 3Com dealers

The Data Base is one of Brisbane's better-known PC outlets, and after only three years, is already one of Queensland's biggest as well as oldest dealerships.

" But the business has changed a great deal from its earliest days," says Brian Clarkson, Managing Director of The Data Base Group.

"We started as all round generalists in a PC consumer world which was very short on knowledge and experience, and there is a core of our business which still deals primarily with the first-time user. About a year ago, though, we realised that the PC marketplace was becoming more complex, and needed more specialised skills and focus."

At that time, the company split into three divisions; retail, for general business; wholesale, to look after smaller dealers and software houses; and a business division to provide a more specialised service to corporate users.

Now, twelve months on, Brian Clarkson has recognised the need for another, even more specialised division, to concentrate on 3Com network solutions.

Why?

Brian Clarkson, The Data Base Group's Managing Director demonstrated the

"Individual PC users are demanding more power and performance and better access to information," explained Brian Clarkson, "and more and more organisations are realising that they have already invested many thousands of dollars in their PCs but aren't getting anywhere near the best out of them.

"Sooner or later they have to choose between junking PC's and replacing them with ever more powerful stand-alone models, or enhancing the power they've already got by giving their users access to each other and the outside world, as well as to minis and mainframes. And, of course, that means installing a powerful network.

" As a business that uses PC's, we were ourselves faced with that very decision, and I know which choice made better sense, not just economically, but in terms of simple productivity. If it was right for us, then it's right for most of our clients as well."

Brian Clarkson and his team invested a lot of time, effort, and care investigating and evaluating competing systems before they chose which system to put their own money into. But now the 3Com network running at The Data Base is in constant use with workstations ranging all the way from an ancient PC to 3Com 3Stations and even a 386 .

The Data Base has used and installed other types of PC Networks but Brian explained why his company is now committed to 3Com.

"We learned a long time ago that insisting on the highest quality we could thing we could do for our customers. And 3Com's hardware and software is simply first class.

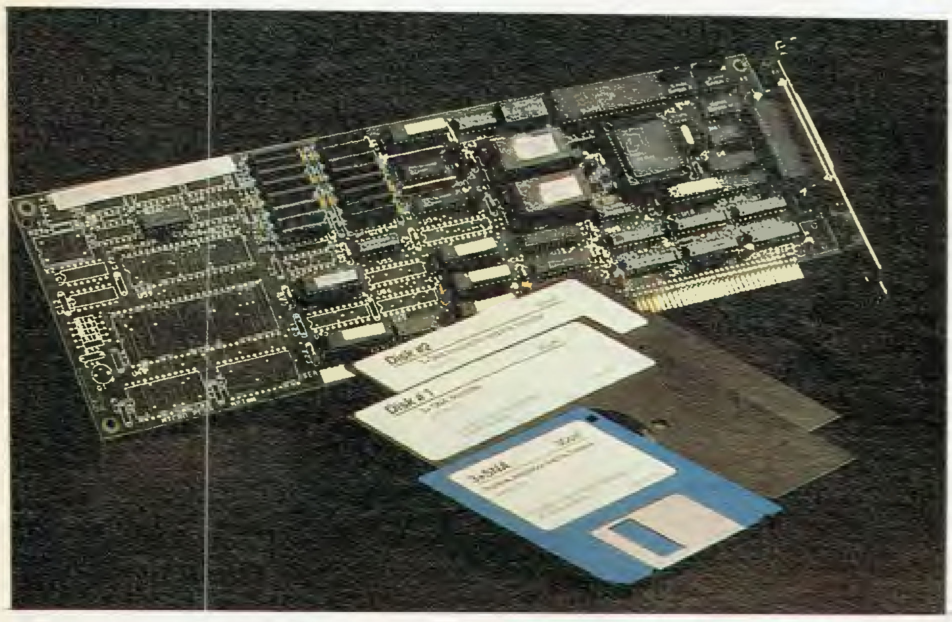
"Another thing we learned was that you can't expect your customers to have confidence in your recommendations unless you use those products yourself and have the hands-on expertise to back them up. Equally important, we can only support our customers properly if our supplier is supporting us, and we've seen the incredible efforts that Imagineering will go to when we call for help.

"And lastly, the best way of protecting ourselves and our customers from obsolescence is to stick with vendors like 3Com who, in turn, stick as close as possible to the current industry standards - for everything.

"After all, before Henry put a petrol engine in the Model T Ford there were motor cars running on steam, coal gas, kerosene, methylated spirit - but where are they all now?

We live in a multi-vendor interconnecting world, and we are convinced that all of the proprietary network systems we have today will go the same way as the Stanley Steamer - except for 3Com.

3Com releases Advanced SNA Gateway



3Com 3+ advanced SNA gateway

In line with its commitment to multi vendor connectivity, 3Com has released 3+SNA, an advanced SNA gateway for the 3Com 3+ network environment.

3+SNA extends the reach of the networked PC beyond the workgroup providing all IBM PS/2 and IBM PC and compatible systems with access to mainframe applications and data.

"The marketplace is basically divided into two different solution types for LAN gateways," commented Ian Simpson, Imagineerings 3Com Product Manager.

"The options are to either adapt a PC as a communications or cluster controller by adding an emulation card and gateway software, or to install a dedicated, designed from the ground up, communications processor as a node on the network.

An example of the latter are the products manufactured by 3Coms Bridge Communications division."

3+SNA adapts an 'AT' class PC to emulate an IBM cluster controller and has features similar to that of an IBM 3174.

3+ SNA extending the reach of the PC network ....

Users of 3+SNA may have up to eight 3278/9 and/or 3287 type sessions concurrently which are similar to what IBM provides with DFT or Distributed Functional Terminal with the 3174. 3+SNA will support line speeds of up to 56kbps which is similar to a V.35 3174 controller thereby allowing users to do highspeed file transfers.

The features of 3+SNA all make for a very good solution for users of 3Com LAN's to have better connectivity to their SNA mainframes as well as features not offered by traditional dedicated cluster control units.

(Continued from page 1)

Without an "open systems" standard Network Management as a tool will remain a wish rather than a product as the overheads that are required to convert protocols and control dissimilar resources will render the solution unacceptable. With such a large section of the market utilising multi vendor systems the market push is clearly evident. In the interim, gateways between the various levels of the computing hierarchy and the respective network management systems will provide a cumbersome but effective solution to the problem.

Product Enquiries

For further information on any products referred to in the Imagineering 3Com Update, can be answered by contacting one of our 3Com Sales Offices located in:

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MATTINGLY IMA 135

Avon rings a bell with DEC — IBM link

(Continued from page 22)

Du Pont has also used DEC's Decnet/SNA Gateway product to support terminal emulation sessions going from Vax to IBM applications running under CICS, TSO and IMS.

Chemical Bank's Rosemary Verrechio Baer, vice-president of online systems planning, pointed out that the retail side of the bank has a large DEC-to-IBM interconnect project under way in which two Ethernet networks are clustered with two Vax 8550s to create a single Lan with 400 intelligent workstations hooked into it. "As far as Lan interconnects to IBM environments are concerned, we probably have one of the largest, if not the largest, in the marketplace," Baer said.

The Vaxes are running datastream code that maintains LU2 3270-type sessions going out through gateways into the IBM environment. The unique aspect of this setup is that users at the workstations do not have to flip out of the mode of intelligent workstation and into a dumb terminal mode to acquire IBM-based data. To the user, it is irrelevent whether the data is on the workstation, Lan or host.

Baer said the design and development was done with DEC's help and New Software's Prism software. "It is a matter of creating a management environment that allows you to proceed," Baer said. Chemical's forays into DEC-to-IBM connections "have given us a technological growth platform that is fairly unlimited and puts us about three to five years ahead of other people in the industry".

> ‘The whole business of transparency and seamlessness is garbage’

But not every MIS shop is given the support for such ambitious projects. And many who have tried question the feasibility and necessity for transparency. "The most common trend is that people want the integration to be completely transparent to endusers, and they are surprised to find the tools are not there yet," Shapiro said. "This is a nontrivial technical problem.

"The whole business of transparency and seamlessness is garbage," added Frank Dzubeck, president of Communications Network Architects, a consulting company in Washington. "I have never seen one that is 100 per cent clean. There is always a ripple someplace you have got to take care of."

The integration problem has received various treatments, depending on the corporate environment. In most shops, according to Larry DeBoever, president of DeBoever and Associates. "It is an accomplishment just to get MIS to agree to put Vaxes and IBM in the same room."

Traditional IBM MIS shops are not thrilled with the DEC insurgence, and this clash of cultures is among the biggest obstacles to the successful integration of the two vendors. DeBoever describes what a customer once told him: "Both sides — DEC and IBM systems professionals — are like different sects of Muslims. They are both convinced they are right and do not want to talk about it."

Giannantonio points out that the professional biases run deep. During Avon's move to DEC in the corporate MIS department, a top systems software programmer came to Giannantonio asking for a change of workplace so he could stop a two-hour daily commuting trip to Avon's Rye, New York, data centre. "We would love to have you," Giannantonio told him. "But you will need to learn the DEC system."

"No way," the programmer replied. "I do not want to lose my technical edge."

More daring MIS professionals are embracing rather than rejecting the new challenge. Those who master both DEC and IBM possess extremely valuable resumes, according to systems integrators.

Like beauty, integration is often in the eye of the beholder. There are, according to DeBoever, nine levels of DEC-IBM integration that an MIS shop needs to consider, ranging from the mundane to the

(Continued page 28)

Stacking up against OSI

Systems Network Architecture	Open Systems Interconnect	DNA Phase IV	DNA/OSI Phase V	
Enduser	7. Application layer	User	• Networked office systems • Videotex • Electronic mail • Computer conferencing • Remote database • File transfer • Virtual terminal • Network management • SNA interconnection • Decnet system services	• OSI FTAM • CCITT X.400
		Network management		OSI presentation
Presentation services	6. Presentation layer	Network application		
Data flow control	5. Session layer	Session control	Decnet session control	OSI session
Transmission control				
Path control	4. Transport layer	End communication (Decnet transport)	Common transport interface	
			Decnet transport	OSI transport
	3. Network layer	Decnet routing	• ISO connectionless service • ISO connection-oriented service. (over CCITT X.25) • ISO routing protocol	
Data link control	2. Data link layer	Data link	• Data link • CCITT X.25 • OSI-standard Ethernet • Digital Data Communications Message Protocol	
Physical control	1. Physical layer	Physical link		

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How Avon integrated IBM

(Continued from page 27)

nearly impossible. In a recent survey of MIS managers and third-party suppliers, DeBoever found that the following requirements must be met to fulfil true and total integration:

- Cross-system terminal access — Vax to IBM. The most common form of DEC-IBM connections;
- Cross-system terminal access — IBM to DEC. Only a few shops are doing this kind of integration, simply because there are only a few tools available;
- File transfer between systems. DEC offers Decnet-Dos access from IBM PCs into a Decnet network. Third-party offerings are also available;
- High-speed bulk file transfer. For those with serious throughput needs, basic file transfer is not adequate, so there is urgency for this requirement today;
- Database extraction and subset transfer. DeBoever predicts this to be a hot topic in 1989. There are few tools now available to allow for database extraction and transfer;
- Distributed database management. Few shops are doing this now. Oracle, Relational Technology, and Cullinet Software — at the Vax level — have products in this area, and more are coming;
- Peripheral device sharing. Users said: "I don't want to buy DEC storage devices, I want to access my IBM disk drive from my Vax.";
- E-mail and document interchange. The requirement with the highest urgency among those surveyed. "This is user-driven," De Boever said. DEC is committed to the OSI X.400 standard in the long run. IBM is only selling X.400 in Europe, claiming there is not enough demand in the US;
- Distributed application development. There are not many options in this area; TCP is the only reliable option now.

Even the most sophisticated MIS shops have not solved all of the integration requirements yet. And those that have done the most have utilised a variety of solutions from different sources. Third-party vendors align themselves like pilot fish to the big whales through co-operative marketing partner agreements with DEC and industry marketing assistance program agreements with IBM.

Joiner Associates provides software for network job-entry applications between DEC and IBM environments. "We find our business coming from existing standalone systems and, more frequently, existing networks where these networks have just been passing like ships in the night. But those networks are growing bigger and thus colliding, and all of a sudden, consciousness is raised that they need to be attached together," said Stephen Arnold, Joiner's product manager.

In the long run, many users prefer the uncomplicated life of dealing with as few vendors as possible. "We've used third-party products when nothing else was available, but our preferred route is to use the primary vendor's product," said one MIS manager at a large corporate shop. "As DEC and IBM bring out products that suit our needs, we will convert to them."

For most MIS shops facing the question of how to tie DEC and IBM together, the task is to puzzle out whether a custom solution with the help of outside consultants, third-party suppliers and systems integrators is worth the high price. Or is it better to wait for DEC and IBM to come to some standards agreements?

The answer to the latter question is an unequivocal "no" in MIS shops that are being pushed today to provide a competitive edge for the company. Waiting for an unknown development in an unstated time frame by an industry as volatile and competitive as computing is tantamount to a deathwish. MIS shops watch in wonder as the leading vendors cry for standards and then seemingly do everything possible to obstruct them. The recent confrontation between warring Unix factions — AT&T-Sun Microsystems v IBM-DEC-Hewlett Packard and others — illustrates the distance between marketing hype and reality in the reach for standards. IBM prefers to acknowledge TCP/IP, though that support is lukewarm, according to analysts. DEC is not anxious to support TCP/IP, preferring to go directly to OSI. The MIS manager can only scratch his head and wait.

Adding to the confusion is the sheer size and power of IBM in this scenario. For instance, IBM announced its SAA plan last year as a common application protocol for IBM products to talk over networks, and suddenly the rest of the industry had to stop and take notice of the implications of SAA. Under the architecture, IBM hopes to deliver a common communications facility, user-access method, programming interface and a set of common applications across three strategic processor families.

This influence makes it difficult for other vendors and MIS managers to commit to certain standards. Until IBM embraces a concept, it barely breathes.

> ‘ It will be a long time before you see real OSI from IBM ’

"IBM talks a lot about OSI, then implements its SNA proprietary architecture," consultant Shapiro said. "It will be a long time before you see real OSI functionality from IBM. DEC is aggressively pursuing OSI, but there is a lot of code to be written. It is a good two years away in the DEC space also.

"What people fail to realise in the integration process is that data communications is a very small piece of it. Data integration is a bigger piece, and that causes a lot of problems."

And while DEC may be more innovative in providing links to IBM than virtually any other major vendor, it is not operating in an altruistic mode either. Ken Olsen's open criticism of such standards attempts as Manufacturing Automation Protocol and Unix makes it clear that DEC hopes to perpetuate its proprietary Vax/VMS world as long as it can.

Unlike IBM, which can let the world beat a path to its door, DEC recognised early on that connecting to IBM was critical. According to an International Data Corp

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system with DEC

report on DEC networking: "The DEC game plan is to provide the industy's best IBM interconnection in an attempt to bait customers (if not already hooked) into the Decnet hemisphere. DEC is confident that if its Decnet networking implementation is laid side by side next to IBM's SNA, in the long run customers will eventually migrate to DEC."

The key offering from DEC in this regard is its Decnet/SNA Gateway, unveiled in 1982. Decnet/SNA is an Ethernet-based software and hardware solution that allows Decnet users to exchange information with users and applications on SNA-based systems. It is a network-to-network product as opposed to a single-function emulation between computers.

Gateways from DEC and third parties provide links between DEC's Digital Network Architecture into SNA, but gateways between protocols are not the true test; gateways between applications are crucial. Vendors are addressing this issue, but as the applications become more complex, the links are more difficult to achieve. For example, as OSI matures in the next few years, the integration of the mini and micro worlds will become relatively easy. But the mini- and micro-to-mainframe world is a tougher nut to crack and will, according to Shapiro, be gateway driven for "a long, long time".

> ‘ Gateways between protocols are not the true test; gateways between applications are crucial ’

Consultants such as Dzubeck point out the drawbacks of gateways. He said he believed the key issue in DEC-IBM integration is throughput and that any approach requiring a Decnet-to-SNA gateway is "architectural disembowelment".

"What happens is that in the process of tearing things apart and then putting them back together, you get throughput degradation — in the first implementation of the Decnet/SNA Gateway, you actually had a ratio that the best you could get out of a 56K-byte line was 9.6K-bytes on the other side. That is pretty sad," he said. Dzubeck pointed out that one antidote to the problem is putting channel connections on the IBM mainframe itself, but a lot of users are hesitant to put foreign devices on an IBM channel.

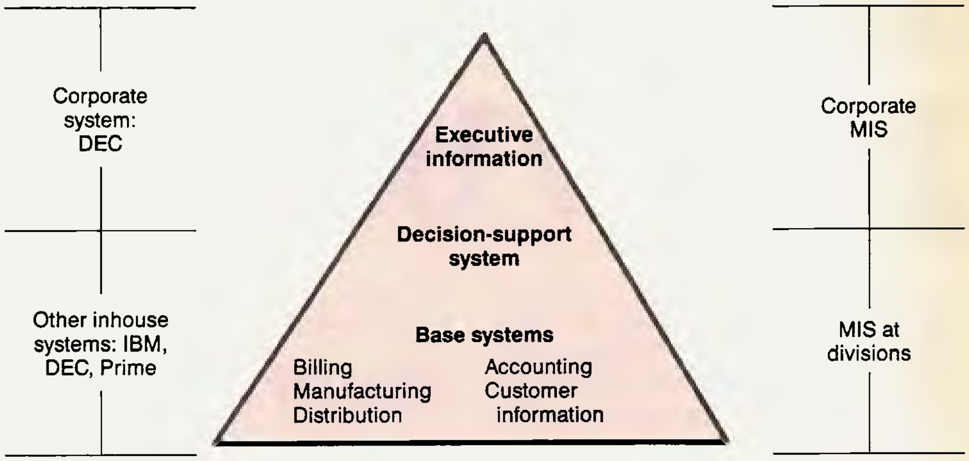
"The issue for the user is the different implementation approaches," Shapiro explained. "Somebody familiar with programming in an IBM network environment has a significantly different thought process from someone doing programming in a DEC environment. Therefore, when we go to integrate these two environments, we have to integrate the hardware, the software and the people. And it is integrating the people that sometimes is as complex as anything else."

For example, in an IBM environment today, it is very difficult to do program-to-program communications over the network. Yet, it is relatively easy to implement very restrictive security systems for terminal access. In the DEC world, conversely, it is easy to do program-to-program communications, but securing the network is more difficult. Shapiro said. Thus, trade-offs are necessary. DEC users typically take a lot for granted and are perplexed at the complexity of the IBM environment.

"DEC users think that it is too much work. 'Why should I have to regen my frontend just to add another line?' they asked. The IBM person told the DEC person, 'I'll schedule that for you next month.' The DEC person got frustrated, and the IBM person can't understand the impertinence. And you have continued friction," Shapiro said.

Because of tradition, many companies have kept the DEC and IBM environments separated. When integration is initiated, often at the behest of endusers, the two factions frequently are left to hash it out themselves. But the two fiefdoms have no predisposition to co-operate; there has usually been little cross-traffic between environments.

Multivendor computing at Avon



INFORMATION PROVIDED BY AVON PRODUCTS INC

In the long run, co-operation is inevitable, whether willing or forced, simply because endusers are demanding it and MIS is under the gun to produce. Large users such as Du Pont have realised the inevitability of the merging of the two worlds. "Among the Du Pont MIS people, there is widespread acceptance of DEC as a major player," Wertman said. "I can't speak for the IBM sales reps, but the Du Pont-IBM people are providing a great deal of co-operation. They know DEC is not going away."

- *Glenn Rifkin is a* US Computerworld *senior editor.*

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FOXY

Electronic mail — users know best and like Memo

Graeme Philipson writes about a Swedish product that is very popular

IBM does many things well, but it does not do everything best. Many IBM sites use IBM hardware and software for the heart of their system, but use non-IBM products where they feel they are better suited to their requirements.

Sometimes these users develop their own products, usually software. And sometimes this software becomes so successful that they find that others users want it too. Then user becomes vendor, and a new computer company is born.

One such product is the Memo electronic mail system, originally developed by Volvo in Sweden. Volvo is one of Europe's largest IBM users, with seven mainframes supporting a worldwide 19,000 terminal SNA network. Volvo is a loyal IBM user, committed to IBM's architecture and philosophy.

When Volvo needed an electronic mail system, however, it looked at the IBM products and found them wanting. At the time IBM offered electronic mail as part of its Disoss (distributed office support system) and Profs (professional office system).

But Volvo believed the system was too cumbersome, and its users started to develop their own. It seemed, in Volvo's words, "a good idea".

It proved to be such a good idea that word of the system spread to other IBM users in Europe, through word of mouth and exchanges at IBM user meetings. Volvo suddenly found it had a marketable product on its hands. And, unlike Volvo's other products, it had nothing to do with motor cars.

Volvo soon realised that it would need help marketing a product in an area in which it had little expertise. So it sought the help of Ericsson, itself a large IBM user and by far Sweden's largest information technology supplier.

The two companies set up a subsidiary called Verimation, now owned 10 per cent by Ericsson and 90 per cent by Volvo.

Verimation was formed to market and support Memo, and now also supplies Sesam (a "single systems image" session management product) and Dialout, which allows SNA users to search and retrieve information from external databases and hosts via an X.25 network.

Memo has become very popular in Europe. Volvo's own system now supports more than 30,000 users, and Memo is in use with such major European organisations as Electrolux, Commerzbank, BMW, Bosch, Philips, Saab-Scania, and ITT Nederland.

It is particularly popular with banks and manufacturing companies. And, although Memo competes with IBM's Disoss and Personal Services, IBM Europe has a high enough opinion of Memo to offer it as a product on its international network service.

Memo was introduced to Australia in 1987 by Software Distribution International, which has the Australasian distribution rights for all Verimation products.

After just a few months, Memo is enjoying great success in Australia. It is being used by the National Australia Bank (NAB) and the GIO-Computations bureau Jecha, and is being tested by many other large IBM users.

Dave Camp, NAB's manager for office automation, said that the bank was impressed enough with Memo to end its pilot with IBM's Personal Services. "It had to be very good to oust IBM," he said.

"All other things being equal, the bank will always use an IBM product over a competitor's," said Camp. "That is the bank's policy. We will only use something else if IBM has no equivalent product, or if the competitive product can be demonstrated to show real and measurable advantages over IBM's."

Camp said that Memo was such a product. "It is four to eight times better in its use of resources than Personal Services, and it gives us much more functionality and control than the IBM system. You can always add functions by customising Personal Services, but that systems runs under CICS.

"That means constant terminal redefinition and the use of exits to customise the system, which can make upgrading a nightmare. Memo, on the other hand, runs as a native Vtam (virtual terminal access method) application, so it is compatible with the IBM environment, as well as being very efficient."

Camp said that NAB began to evaluate electronic mail in 1985, when it set up an office automation group to create a coherent OA strategy for the bank.

The bank was committed to its large SNA architecture and IBM hardware, so the logical choice seemed to be to use IBM's OA product, Disoss, and IBM's personal services products PS/370 and PS/PC.

NAB's pilot study of the IBM system ended in September 1987. "We decided that PS/370 was usable, but that PS/PC was not," said Camp.

"We wanted to run the system from the branches, but projected CPU loads were a concern. So we started to look at other products that conformed with the IBM architecture and complemented our existing products.

"We looked at ADR's E-mail before coming across Memo in October 1987. We had a look at it running on ACI Computer Services' system, and liked it enough to give it a trial run. We asked some European banking users what they thought of the system, and they were unanimous in their praise. We could not find a Memo users' group, but users' groups usually only arise when there have been troubles."

Memo was installed in November 1987 in NAB's information centre, initially for evaluation as a replacement for the inadequate IBM PS/PC.

> ‘We're adding more than 100 users a month. There is a very high level of acceptance, even among non-DP users’

"But it soon became apparent that it was a very good product indeed, and we started to look at it seriously as a replacement for the entire electronic mail system."

Camp recommended that at the end of December, and Memo began to be implemented in February of this year. Since then, Memo has moved from the information centre to serve more than 800 users throughout NAB.

NAB shuts Memo down for 30 minutes each night to run backups. "We back the system up daily, but the integrity is such that we've never had to go to the backup data sets," said Camp.

He also praised Memo's security features. "It has its own security features, but can interface to IBM's RACF standards."

NAB uses Memo for all manner of internal communication, from informal messaging to management reporting. NAB sees all its branches as potential users.

"We're adding more than 100 users a month," said Camp. "There is a very high level of acceptance, even among non-DP users. We plan to have more than 3000 users eventually. Then we will move to multiple interconnected systems, probably one for each State."

When that happens, NAB will be a major Memo user by world standards. Memo's success with NAB, and the interest being shown by other users, shows that IBM, for all its strengths, is not always the best judge of what the user wants.

"Anyway," said Camp, "IBM still does very well out of it. We are adding many terminals because of Memo, and IBM supplies all of them. And every 30 or so terminals means another IBM controller."

IBM might not always win. But it rarely loses.

■ ***David Camp . . . 'it had to be very good to oust IBM'***

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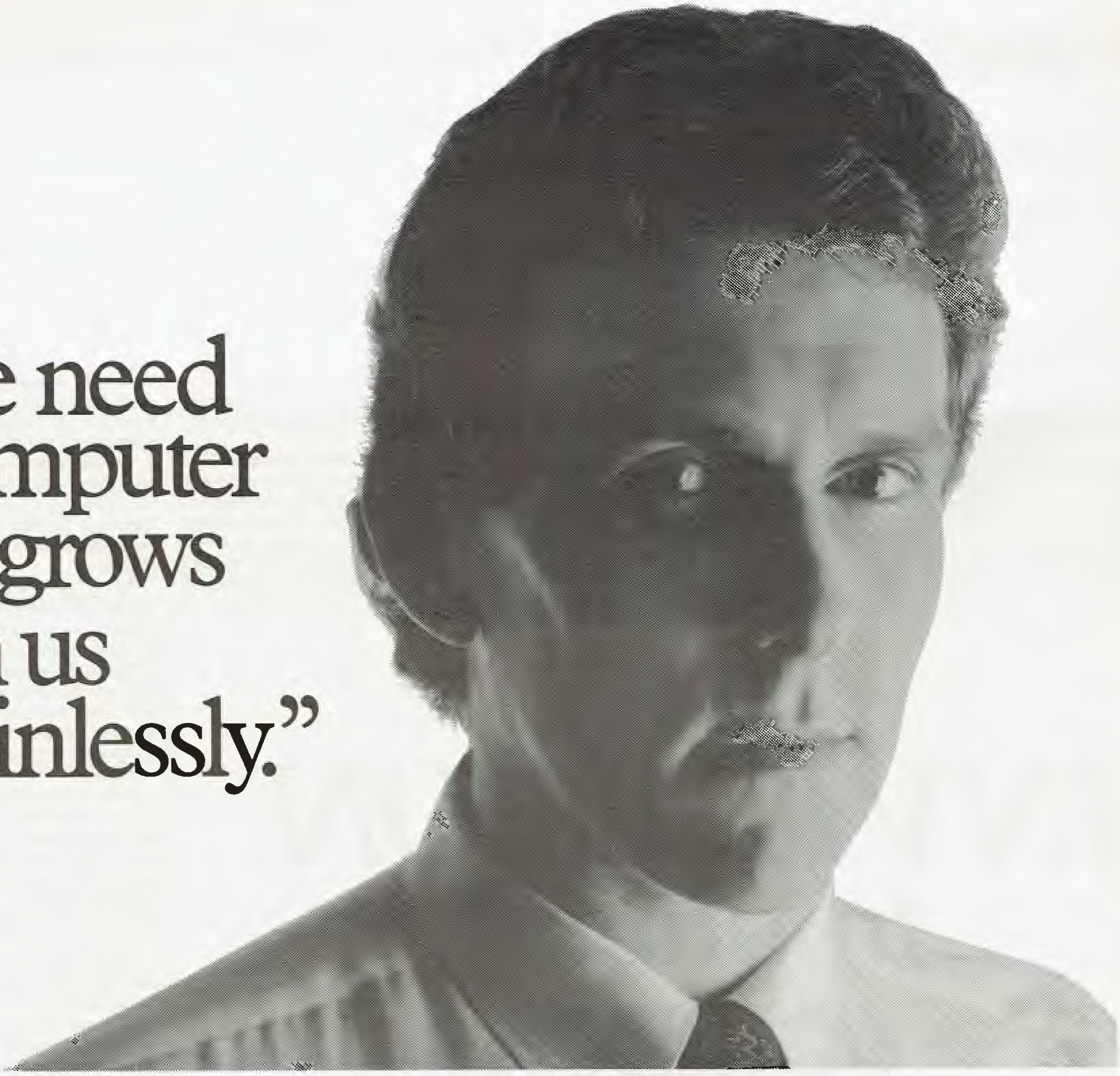

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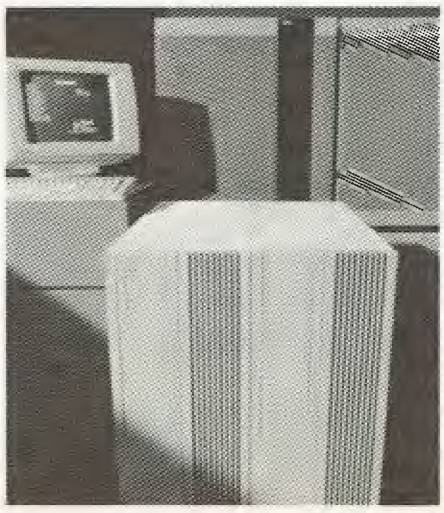

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Council links mapping into vast network

■ *At Hornsby Shire Council, on Sydney's northern outskirts, staff can view three-dimensional pictures of existing and planned developments*

HORNSBY Shire Council has started work on a land information system, which will be the most advanced in Australia when fully operational in early 1989. It will be a component of a complex network supporting about 180 devices of diverse types.

Using computer graphics screens, council staff will be able to examine computerised maps showing the boundaries of the 42,000 parcels of land in the council's area.

A pilot scheme allows council staff to view three-dimensional representations of existing buildings and proposed developments in the shire's central business district. The mapping system displays structures from different perspectives and enables staff to determine where shadows will fall on surrounding areas. Simulating a block of offices can take less than five minutes and demolishing them requires less time again.

The mapping system runs on two IBM RT systems, which form part of an information systems network that will see a high-resolution color screen or IBM Personal System/2 computer on every desk at the council. At the hub of the network is an IBM System/38 Model 700 computer. Connected to it will be 72 color screens, 76 Personal System/2s, 31 printers and the two RTs.

The hardware was sold by Stowe Computing Australia, which is also supplying its local government software package, Total Corporate System (TCS). Cadcom supplied software called Eagle for the mapping system.

When fully implemented, the network will give Hornsby Shire Council one of the largest System/38 installations in Australia, costing about $A2.2 million.

The IBM Personal System/2 computers will provide word processing, modelling and other forms of decision support to many of the staff. The complete network is expected to provide for the needs of the council over the next 10 years.

Remote terminals and Personal System/2 computers will be installed in libraries at Epping, Pennant Hills, Berowra and Galston, at a council store, and at fire control headquarters. The network is being installed using the IBM Cabling System, which provides a standard method for connecting different types of IBM equipment.

Ross Goff, the council's DP manager, said the networked system would bring many benefits. "It will certainly raise the productivity of council employees. Instead of shuffling through large paper files to get information about a property, they will be able to view details about every parcel of land on a screen and in color.

More efficient

"The database will be available to every employee, which will solve the problem of several people trying to use a particular file at the same time. By improving the productivity of our 500 employees, particularly the 200 internal staff, we will contain the council's running costs."

Another benefit of the mapping system, Goff said, was that the council would be able to offer a more efficient service to the public.

"If we intend to dig a trench across a road or carry out a controlled burn-off in the bush, we can send a letter to residents in the area affected, explaining what will happen and when. By holding all property information in a database, selecting and printing names and addresses will be very fast."

The Metropolitan Water, Sewerage and Drainage Board has provided base data for the blocks of land, which has been transformed into Eagle using software supplied by Cadcom. The council is contacting other Federal and State authorities for other information.

To create three-dimensional representations of buildings in the central business district the council commissioned a light aircraft to fly over a 1sq km area taking still photographs at predetermined reference points.

Council staff can view existing and proposed buildings from different angles, see where new structures will cast shadows, and judge the impact of buildings on the skyline and streetscape.

Hornsby Shire Council administers an area of 510 square kilometres on the northern fringe of metropolitan Sydney.

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If you are part of the Australian high-tech industry you should make the effort to be part of this discussion. Jingoistic attitudes and egos have no place in this session, so leave them behind, come along and contribute in a positive way to determining the future direction of high-tech manufacturing in Australia.

Andrew Bertie, Assistant Secretary Information Industries – Department of Industry, Technology and Commerce, Canberra
Ian Bennetts, Managing Director – Computer Corporation Australia
Greg Watson, Managing Director – Microbyte Systems
Richard Brett, Executive Director – Australian Electrical and Electronics Manufacturers Association
Neville Angove, Managing Director – Neville Angove & Associates
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The clash of two cultures

IBM meets OSI. Peter Scott reports

MOST of the significant efforts to provide interconnection of unlike computer systems have centred on the Open Systems Interconnect standards from the International Standards Organisation.

Users are keen to see fast progress with open connectivity for business reasons. Uninhibited data access and exchange within and between corporations promise increased efficiency, reduced costs, better service and the elusive competitive edge.

Vendors are backing OSI because it means new applications and so more business.

IBM's attitude to OSI has been questioned from time to time. It has been felt by some observers that the company has tried to force its own proprietary systems into the standards books. There is sometimes reason to believe that IBM's attitude is that the sheer strength of the IBM user base puts the company in a dominant position, allowing it to set the standards to which the rest of the world must conform.

These views have been acknowledged, but not accepted, by IBM personnel. "The two acronyms — IBM and OSI — are sometimes thought to be a contradiction in terms", noted Donna Vaughan of IBM Australia.

Speaking at a conference of Public Service DP directors last month, Vaughan claimed that the reality was quite different.

"IBM is resolutely in favor of standardisation and plays a major role in the development of OSI through its involvement with various standards and associated bodies, its research efforts, the experience it brings to ISO and other organisations as a vendor of a functionally rich network architecture, and as a vendor of OSI products.

Protocol converter

"Essentially we believe that OSI complements SNA by providing standardised links between networks while allowing users to take advantage of the additional functions which may be offered by a proprietary network architecture within a network or system," Vaughan claimed.

Solutions offered to date for connecting systems that follow different standards for data communications have been ad hoc and have required a protocol converter for every different type of system connected.

"Some vendors developed gateways to other vendors' systems where there was a good business reason to do so. For IBM, the problem was more complicated than for most, since there was not sufficient demand for a gateway to any one proprietary system — or even a limited few — to warrant development of such gateways other than Ascii or BSC," she added.

Now the game has changed. The possibility of losing business by failing to conform to internationally recognised standards has brought IBM right into the OSI arena, although the company's justification for the move is phrased differently, placing emphasis on users' needs.

"Each vendor has a responsibility to develop systems which meet customer requirements for efficiency, performance, and so on, and at the same time meet the requirements of communications interface standards. How this is achieved will vary depending on where the vendor is coming from.

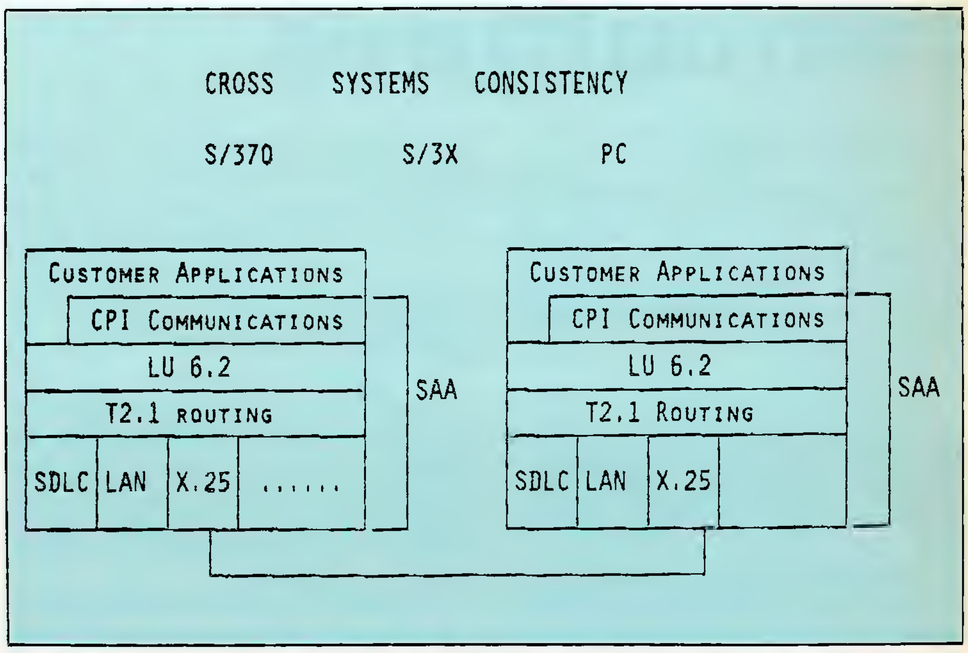
"For example, a vendor such as IBM, which has a network architecture today providing functions beyond the scope of OSI, and which is used by more than 30,000 networks around the world, must protect the investment of those customers in Systems Network Architecture.

"Those customers expect IBM to continue to enhance SNA to meet their new and changing requirements and, in particular, to provide the ability to use OSI connections when communication with other vendors' equipment (inside or outside the network) is necessary," Vaughan explained.

She also cast doubts on the usefulness of the present OSI standards. "The status of OSI implementation does not match what can be achieved today. If the requirement is a secure, reliable network with proper network management protocols and applications, then a significant amount of user code is required to implement OSI either inter- or intra-enterprise.

"The maturity of a standard is measured

(Continued page 34)



■ *Systems Application Architecture (SAA)*

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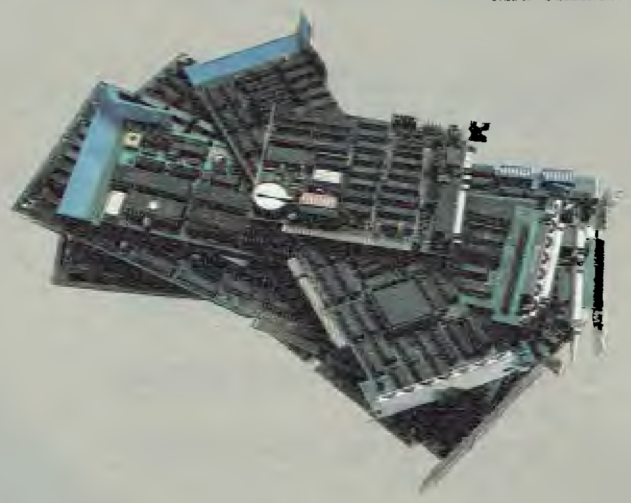


The clash of two cultures

(Continued from page 33)

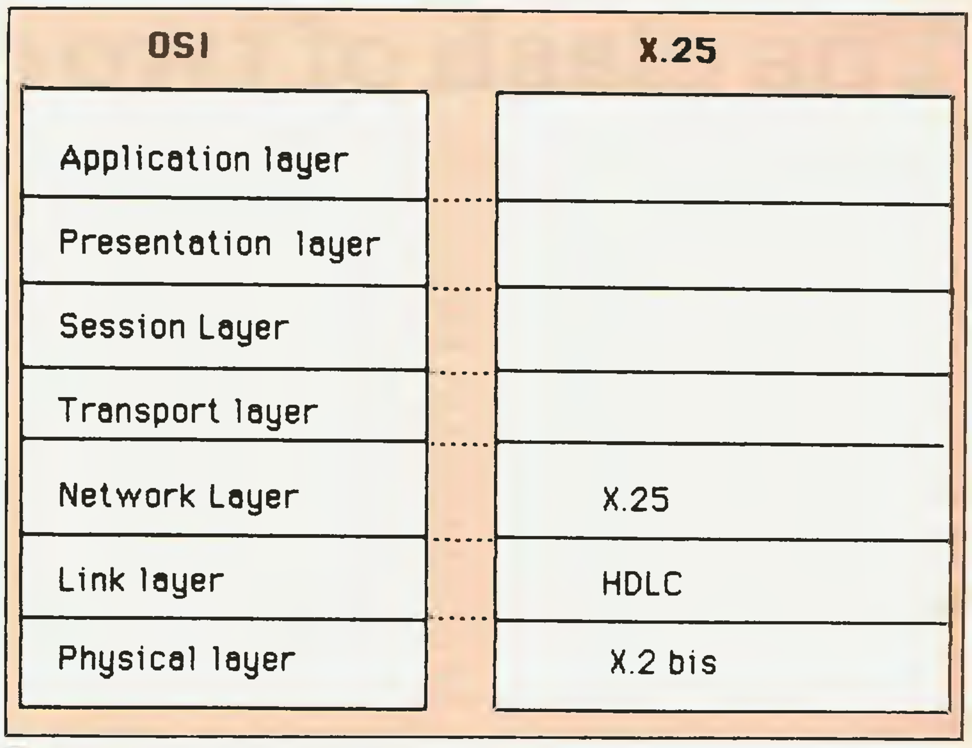
not only against the degree to which it has been implemented, but also by the compatibility of the various implementations, security and network management offered. Against this standard X.400 could be mature in one to three years and OSI in five to 10 years.

"SNA was first announced in 1974. It has been enhanced many times since then and will continue to be enhanced in response to our customers' needs. Work began on OSI only in 1976," Vaughan said.

Despite this somewhat ambivalent attitude to OSI and its effectiveness, IBM has become involved in the search for standards. Vaughan claimed that the company had already implemented ISO standards for layers one to seven of the OSI Reference Model so as to provide connections between SNA systems and non-SNA systems using OSI protocols, as well as a common base for the development of OSI-specific applications. The company has also implemented CCITT standards for Layer Seven (X.400 Series).

In 1985 IBM issued an OSI Directional Statement regarding OSI products for the System/370 environment. Vaughan claimed that statement had since been fulfilled for those layers of the reference model for which international standards have been published.

A number of products for OSI have been issued by IBM, including recent offerings for X.400 message handling.



OSI	X.25
Application layer	
Presentation layer	
Session Layer	
Transport layer	
Network Layer	X.25
Link layer	HDLC
Physical layer	X.2 bis

■ *A comparison of OSI and X.25 protocol layers shows why X.25 Pads connot be considered as protocol converters, despite popular misconceptions*

The company has also undertaken a number of projects to assist users wishing to implement OSI. These include involvement in the efforts of the Societa Interbancaria Automazione in Italy to provide message-handling, interbanking, and file transfer facilities to members' banks.

An interim solution has been operating since 1986, handling 50,000 messages a day from 47 banks.

Three IBM centres conduct research into various facets of OSI.

But while IBM continues to pour a great deal of effort into OSI development and standardisation, users are most concerned with the relationship between SNA and OSI.

Vaughan acknowledged that users will expect continued enhancements to SNA, including OSI connectivity in a mixed environment. The company's intention in this field is to provide and enhance SNA communications functions; to continue to participate in standards setting activities; and to evaluate standards, requirements, and the business environment with the aim of developing timely compatible OSI products, Vaughan explained.

Exploitation

"We believe that SNA and OSI are complementary in the facilities they provide for a user and that this joint approach best addresses the functional requirements of any data communications network," she added.

Vaughan also had advice for users considering taking advantage of OSI.

She said users should:

- Plan for exploitation by examining business application connectivity requirements over the next five to 10 years;
- Provide feedback to vendors and local standards bodies such as the Standards Association of Australia and the National Protocol Support Centre, on requirements in terms of applications and functional standards;
- Demand from vendors conformance to the standards (not the model) and proven compatibility with each other.
- Identify a migration strategy.

Two migration strategies were proposed:

- The first is to use those products and standards that are available and which offer a programming interface that can be used by other products which implement proprietary protocols for the higher layers. Alternatively, users can write their own higher layer implementation based on draft OSI standards.
- The second strategy minimises the effort involved in migration and offers "greater flexibility".

Vaughan emphasised that user input to the entire standard setting process is essential.

Computer fraud

AMSTERDAM. A Dutch court jailed a junior bank clerk for 18 months for breaking into a computer system and ordering $US8 million ($A10.43 million) transferred from a New York bank to a Swiss bank account. Frans Noe, 26, used a computer user-name and password stolen from a safe at Lloyds Bank's Amsterdam branch office to break into the SWIFT international money transfer system.

Prudential-Bache employee busted

Prudential-Bache employee busted last fall for allegedly engineering an unauthorized all-electronic "transfer" of $8.5 million in bonds from the firm's London office to a Swiss bank account in Feb. '86. The transfer apparently escaped detection by PB's security systems, and was only noticed after Euroclear, the settlement agency, routinely confirmed the transaction. For several hours, before a Swiss court seized the transfer, the thief could have sold the bonds. Police charged a 25 year-old supervisor in PB's Eurobond settlement department.

Hacker held by French police

FRENCH police have arrested a young German computer hacker in connection with the infiltration of sensitive French computer installations.

Steffan Werney, a member of the Hamburg-based Chaos Computer Club, was arrested in Paris where he was attending a convention on computer security.

Among the institutions infiltrated by the club were the European Institute for Nuclear Research and a scientific network NASA-SPAnet.

Dangers of Failsafe Computing

On Dec. 24, an Amsterdam bank officer ordered $15.1 million in electronic funds transfers to a Swiss account opened by two confederates. Such transfers must be approved by two bank officers, but the Amsterdam banker had apparently learned of another executive's password and with two "secret" passwords appended, the transfer slipped through.

Traditional Access Systems Offer No Defense Against Viruses.

Traditional access control systems — RAC-F, ACF2 or Top Secret on IBM systems; their equivalents on VMS and UNIX — offer virtually no defense against viruses, except to the extent they bar the front door to unknown users, according to leading security experts. And since most commercial systems still rely on mere password systems for ID authentication, even the front gates are relatively weak.

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Mainframe erosion continues

By Stanley Gibson

THE boom in personal computers and local-area networks is continuing the erosion of mainframe computing begun by minicomputers, according to many experts.

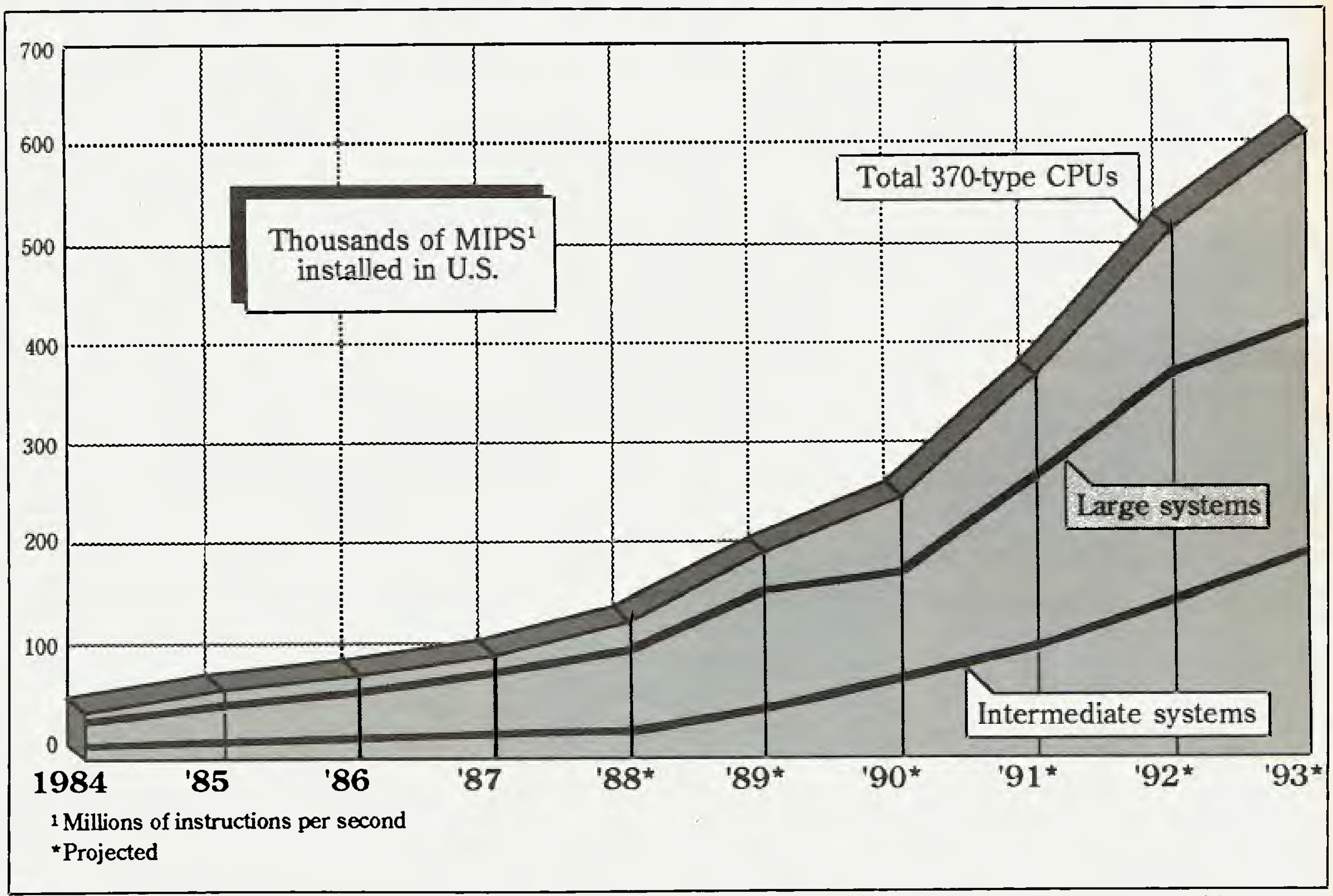
But that does not spell doom for mainframes, judging by a recent study by Annex Research. In fact, the report shows that mainframe Mips are approaching the start of a five-year growth spurt.

Although the number of millions of instructions per second (Mips) running on mainframes will increase, the number of mainframes will diminish as more processing power is crammed into a box. Such has been the trend since the 1970s, said Bob Djurdjevic, president of Annex.

"Multiprocessing contributes to this trend," Djurdjevic said, explaining that putting more than one CPU into one box increases computing power and the number of applications that can be processed but does not increase the population of mainframes.

"Highend Mips growth had been in the single digits. It will increase to a double-digit growth rate," he said.

Although IBM's Summit series, which is expected in late 1989, will contribute to mainframe growth, Djurdjevic said: "I am not particularly bullish about Summit, but about the mainframe market in general."



[1] Millions of instructions per second

*Projected

■ *Overall, users will devour five times more Mips in five years. (But Mips growth on big CPUs will be faster and big system purchases will taper off)*

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5 UNIVERSAL CHARGING INTERFACE    (UCI)
6 CICS CHARGING INTERFACE    (CCI)
7 IMS CHARGING INTERFACE -   (ICI)
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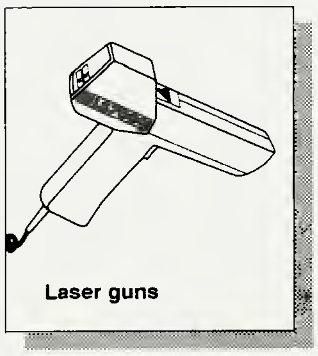

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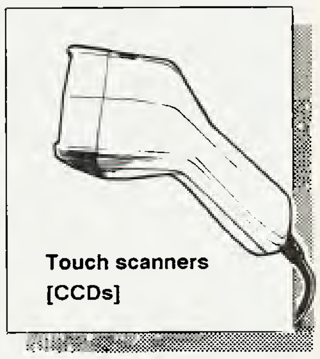

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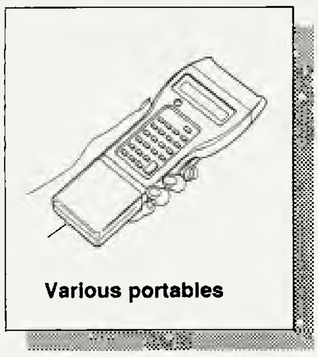
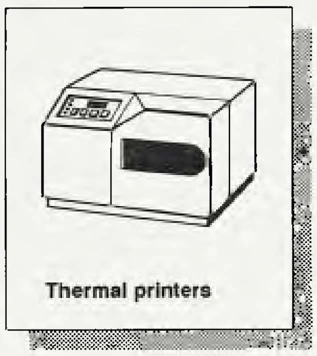
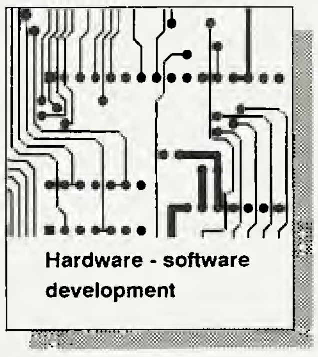


Various portables



Thermal printers



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The 9370 plot now begins to thicken

Stanley Gibson and Rosemary Hamilton take stock of the 'other' midrange machine and its future

IBM's 9370, having stumbled in its charge against Digital Equipment Corp's Vax midrange series, is taking on an identity different from that originally planned by IBM.

Conceived as a corporate departmental processor in accounts with IBM 370-architecture mainframes, the 9370 appears to be having more success as a standalone host system for smaller business users. Even IBM has admitted surprise at the uses to which the slow-selling processor has been put.

"There are areas of business opportunity we would not have anticipated in October 1986, when we announced the 9370," said J F Skeen, IBM's director of 9370 marketing. Among them are new applications for computer-aided design and manufacturing as well as Pick Systems' Pick and Mumps, both operating systems.

Although Skeen stopped short of revealing actual numbers of shipped or installed machines, he said 40 per cent of the installed 9370s were the first computers ever installed at those sites.

"We were not looking for a 9370 but for something to run Cad," said Steve Weage, marketing manager at Buckeye Custom Products.

■ ***AS/400 Model 10 . . . IBM is also taking the midrange seriously***

> ‘ I came from a System/38 background, so I know ease of use; I don't consider the 9370 to be that. You need a staff to run it ’

Support costs for an IBM 4341 would have been beyond his small company's budget, Weage said. The company is running two IBM 5080 graphics terminals with the IBM-marketed computer-graphics-aided three-dimensional interactive application, or Catia, on an IBM 9370 Model 40 running under VM/IS.

Johnson & Johnson Baby Products runs Cadam on a Model 60 under VM/IS. Seven 5080 terminals are connected to the minicomputer, which is not connected to a larger system, said Johnson & Johnson engineering manager Joe Hayek.

Sears, Roebuck and Co is using about 25 9370 Model 40s and 60s — not as departmental processors, but as distributed print servers for the publication of corporate documents.

At the same time, many other large accounts that were the original target of IBM's 9370-based distributed processing strategy have declined to use it. A number have reportedly expressed more interest in personal computer local-area networks than the 9370.

"Among big users, the negative attitude toward the 9370 has been hardening," commented John Logan, vice-president Aberdeen Group.

Major software developers, although saying that many of their existing mainframe packages will run on the 9370, are not investing additional energy in optimising those packages or in developing new packages for the 9370.

But while the software world's heavy hitters have turned their backs on the processor, small developers with niche products have been more attracted to the 9370. The Ultimate Corp resells the 9370 with its version of the Pick system; Mitrol sells a manufacturing automation package; and Chart Inc is porting its 4300-based health care package to the 9370.

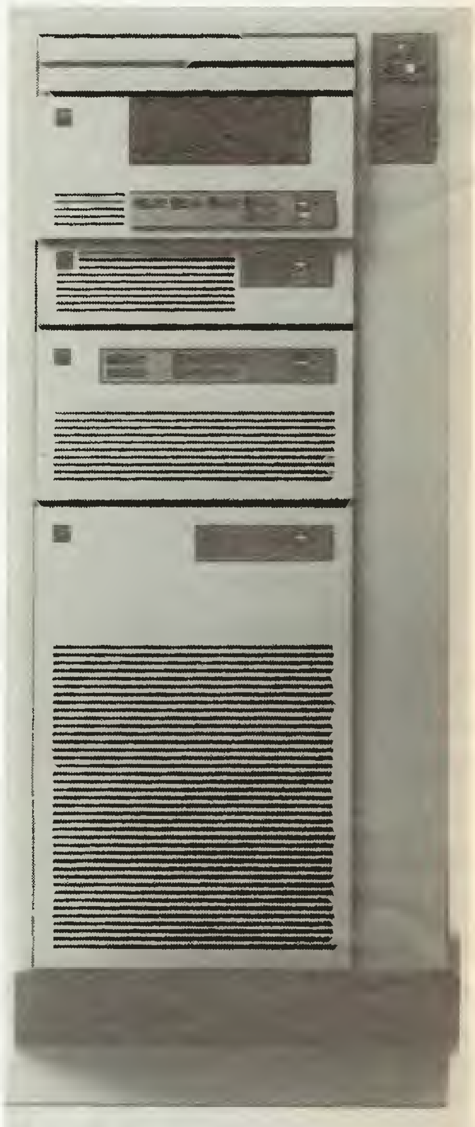
"The 9370 has not taken off as people had thought, but in the past few months, we have seen an uptick," said Mike Zisman, president of Soft Switch. Software Switch introduced a corporate electronic mail system based on the 9370 last year. Soft Switch became a member of IBM's Industry Marketing Assistance Program in January.

To make installation easier for customers, IBM has offered to preload operating systems, including its VM, VSE and DPPX/370, on to the 9370 before it is shipped from the manufacturing facility in Endicott, New York. The option was announced in March and is set to be available in the third quarter.

Such steps could help overcome the ease-of-use roadblock that many report when confronting VM or VSE on the processor. "I came from a System/38 background, so I know ease of use. I don't consider the 9370 to be that. You need a staff to run it," said Donald Zager, director of DP at Bozzutos Inc, a food wholesaler.

Bozzutos moved from a 4341 running VM and VSE to a 9370 Model 90 running VSE Release 3.1 in November 1987. "Since it was touted as an enduser machine, I expected the software to be much easier than it is," Zager said.

Ironically, the 9370's unexpected progress in niche markets may be jeopardised by the rollout of Silverlake, IBM's System/36 and 38 follow-on processor announced June 22. As a follow-on to the System/36 and /38 processors, Silverlake is expected to be relatively easy to use and will draw on the wealth of applications for those machines, which are largely for smaller businesses.



■ ***IBM 9370 . . . will Silverlake actually help it?***

Thus, Silverlake could drain interest from the 9370 in one of the areas in which it has been strongest.

And whether the 9370 will be able to rebound in the market it was intended for remains in question. Despite a loaner program in which IBM is giving large accounts free use of 9370s for development, there is little evidence that many companies have big plans for the processor.

"We have not found any corporations that have large quantities installed," said Ralph Bush, an analyst at Computer Intelligence. Computer Intelligence has estimated that 3000 systems are installed in the US. Three or four systems was the top number at any given location, Bush said.

A portfolio of customer installations recently released by IBM shows 12 installations, only one of which — the much-publicised US Postal Service order for at least 750 systems — is for a large number of machines.

Robert Wilson, vice-president and general manager of information systems at Dataquest in San Jose, California, said: "What is missing is packaged solutions. This is an office system. Users do not want to run a mainframe package on it."

Wilson took the view that Silverlake will actually help the 9370 by clearing up hazy distinctions between the two machines. "Silverlake's annoouncement will convince a lot of people that IBM is serious about the midrange," he said. "By this time next year, you will see enough applications on the 9370 to assure its future."

An outcast among developers

LARGE software developers, facing hard choices about where to spend their development dollars, are opting to invest time and energy in IBM's Silverlake or DEC's Vax, saying that they will invest in IBM's 9370 only when it sells in sufficient numbers.

One user reported that developer ambivalence made his search for a 9370 application more difficult.

"There are plenty of 370 applications, but, in reality, if you go to MSA or M&D, they say, 'We won't sell you one for the 9370.' I felt they feared that if you loaded it, it would bring the system down to a crawl," said Stewart Bacheler, director of MIS at Odd Lot Trading.

A McCormack & Dodge spokesman said his company is exercising caution in recommending the machine.

Shortly after the 9370 was announced in 1986, Cullinet Software said it would develop a database management system for the machine. However, the 9370 project is now on hold, according to Gene Kaplan, Cullinet's project manager for systems. Cullinet has since put all its marbles behind the Vax for midrange development, having recently announced IDMS/SQL, a Vax-based DBMS. Kaplan said the company has no definite plans for Silverlake.

Management Science America (MSA) is stressing Silverlake development, said Brian Cohen, the company's director of technology and research.

"The No 1 priority is SAA. Silverlake is a big part of that," Cohen said, referring to IBM's Systems Application Architecture. "We have limited resources, and right now the 9370 just doesn't seem fruitful. It doesn't come first on our list."

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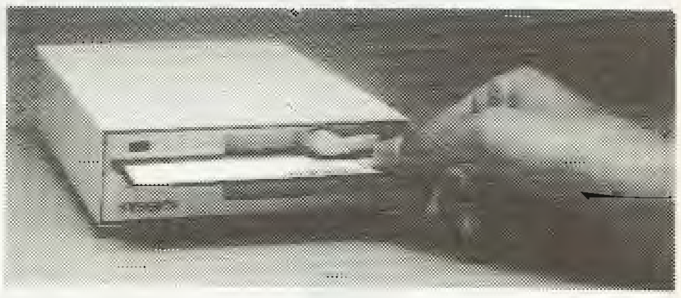

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Does the reality match the dream, asks Michael Gallagher

Plug-compatibles — let's look at the facts

THE plug-compatible peripherals manufacturers discovered Australia in the early 1970s and have been with us ever since. What is their track record? It was a long time ago in computing terms when the Memorex mouse first roared against IBM and successfully began to gain converts to the plug-compatible cause.

Most things in the computing business have changed in the intervening years, but the rationale for plug-compatible purchasing has remained remarkably constant.

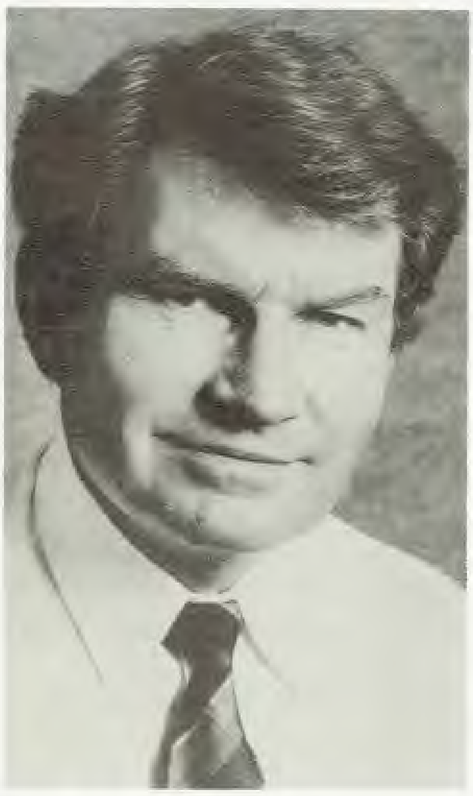
The sales formula is tempting: buy a system that is a good or better than the IBM equivalent, for significantly less cost.

Operating as we do under the IBM umbrella, buying and selling in an active market for pre-owned equipment (no matter what technology is the flavor of the month) we have to take a long-term perspective on the merits of individual systems. This has led us to a cautious attitude toward the plug compatibles.

The tall poppy syndrome works against IBM and in favor of the plug-compatibles, yet if we put sentiment aside and look at the realities of the situation, what do we see?

One of the most obvious facts is that there is virtually no market for used plug compatibles. So users should think twice about buying one, if they are looking to dispose of it in the foreseeable future.

We can always sell a used IBM peripheral for a better price than an equivalent brand new plug compatible still in its plastic wrapping. The premium for a used current model IBM display or printer is about 20 per cent over a similar but new non-IBM model.



● *Michael Gallagher is managing director of Brisbane-based used IBM equipment broker, Computer Merchants Pty Ltd.*

Recently a plug-compatible supplier offered us one of his products for our own use. This new, non-IBM unit cost $A16,000. A similar but used IBM unit he had recently traded was being made available for $A21,000.

People do not pay these higher prices for used IBM equipment without a good reason. After 17 years of exposure to plug-compatible products, ignorance of alternatives cannot be the explanation.

Our experience suggests a number of reasons why IBM gear is valued higher over the long term. It is generally designed and built along more conservative lines, and is thus less prone to failure.

Are we biased toward IBM? Perhaps, but our attitude is supported by facts. A report in the September '87 issue of News/34-38 detailed the results of a US survey on plug-compatible displays and printers versus the equivalent IBM products.

The results may be summarised as follows: IBM displays and printers have less hardware maintenance calls, and the calls on IBM equipment are "less severe". The IBM response time to maintenance calls were incidentally also less than half of the OEM response time.

Out of 50 sites surveyed, 65 per cent of those using IBM printers exclusively reported printer hardware problems severe enough to require a service call. Seventy-four per cent of the shops using non-IBM printers reported problems requiring a service call. The average "problem severity code" was 1.7 for IBM printers and 2.0 for non-IBM gear.

Reliability problems were even more marked among displays. Half of the System/3X shops, which used exclusively IBM displays, reported no hardware problems with their displays. Only 21 per cent of the shops using non-IBM displays could make the same reliability claims. The corresponding problem severity code averaged 1.3 for IBM and 2.0 for non-IBM displays.

Maintenance is an important factor for any DP shop and when an installation is all-IBM then life does become much simpler. Your maintenance is performed by IBM personnel on IBM peripherals connected to IBM processors. This "one-stop shop" means users do not have to act as maintenance co-ordinators between the repairer of the plug-compatible equipment and a (sometimes deservedly) sceptical IBM customer engineer.

> ‘Some of the scare stories about plug-compatibles not living up to their names are, unfortunately, true’

Some of the scare stories about plug-compatibles not living up to their names are, unfortunately, true. Cases we have come across include:

- Displays working on a S/34 but not a S/38;
- Displays working with a 3274 controller and not with a 3174 controller;
- Equipment working OK on one release of IBM software and not on the next release.

Undoubtedly, OEM suppliers will be looking anxiously at how their equipment interfaces with the new Silverlake (AS/400) boxes.

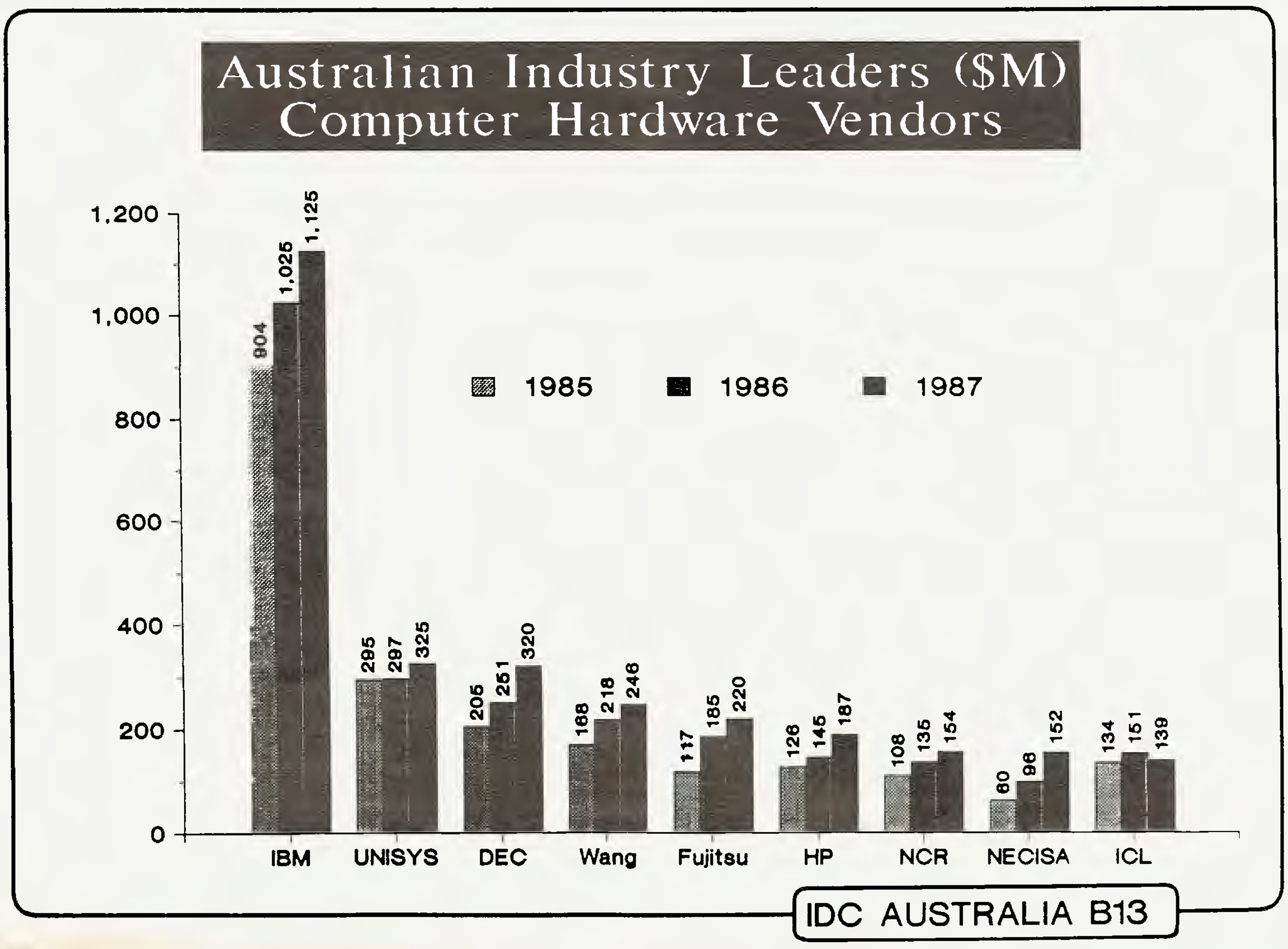
Future compatibility is another factor to be considered. It has been suggested that IBM deliberately looks for small design changes as ways to upset the plug compatibles, but we do not subscribe to this view.

IBM has enough on its plate to ensure compatibility between its own systems, without bothering about foreign gear. A lack of compatibility with OEMers may come about simply as a result of IBM trying to improve its own equipment.

A hypothetical example would be IBM experiencing failures on a certain circuit card due to timing problems and as a result redesigning that card and changing every card in the field.

Of course, there is no love lost between the OEMers and IBM, but IBM's method of protecting its market is more likely to be through broader strategies. Whether due to these strategies or not, the fact is that many a plug-compatible business which was gong to set the world on fire has quietly sunk without trace.

From where we sit, it is clear that the best and safest way for the IBM user to save money — the original and still the major rationale of the plug-compatibles suppliers — is to purchase properly certified, used genuine IBM equipment, through a reputable source.



■ *From the 1988 industry briefing session of International Data Corporation*

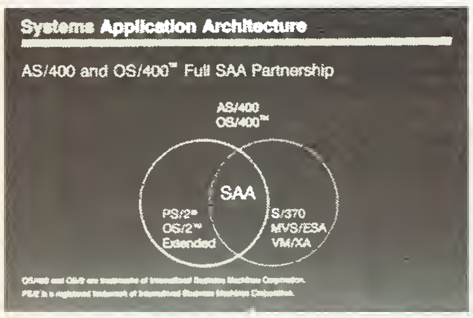
SAA — the message

'Foundation for using solutions across all systems'

FINDING better ways to put information to work for people, by improving the productivity of a growing population of computer users, remains the primary goal of many computer suppliers.

When enterprises may simultaneously be using personal computers, departmental and mainframe systems, the need for comprehensive enduser support systems is a secondary, but equally important, goal.

IBM claims its Systems Application Architecture (SAA) uniquely addresses both these issues by giving customers the foundation for developing and using application software solutions across all major IBM systems — the PS/2, S/3X and S/370.


Systems Application Architecture

AS/400 and OS/400™ Full SAA Partnership

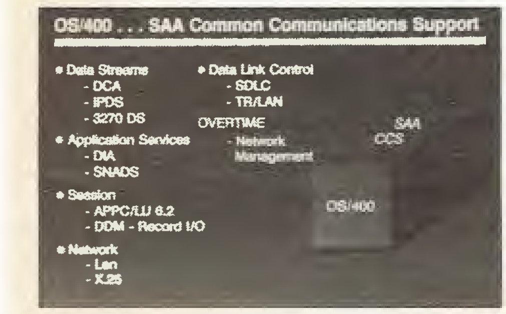
Though supported across all these environments, SAA is to be seen as independent of all of them — its focus is on leveraging productivity by providing endusers as well as application programmers with simple, consistent interfaces for IBM products. Each of these hardware families has its own associated programming, communications and systems control programming. By enhancing application software consistency across these different system environments, SAA will give IBM customers a common user view of systems and applications, via Common User Access (CUA); productive application development, via a Common Programming Interface (CPI); cross-system interconnection and data access via Common Communications Support (CCS); and common applications that will run consistently across them all.

The first elements of SAA were announced in March and April of 1987, and there were further announcements in October and November. IBM has indicated it will enhance and expand this architecture in an evolutionary fashion. In some aspects SAA will mirror the development of another major architecture standard, Systems Network Architecture (SNA).

Systems Application Architecture will define common terminology, layouts, menus and so on. Users will be presented with a consistent "look and feel" across applications and IBM systems.

More productive user interaction will be made possible through adherence to Common User Access (CUA), which provides application developers with guidelines for defining basic user interface elements and interface techniques. These include Screen Layout, Interaction Techniques, and Keyboard Usage.

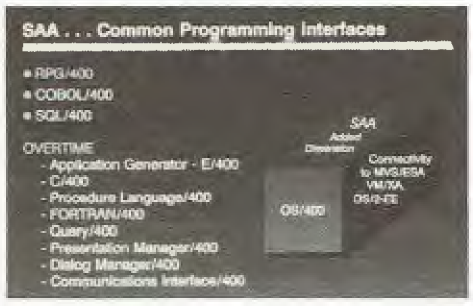
The primary goal of CUA is to achieve ease of learning, transfer of learning, and ease of use. These benefit enduser productivity, and help protect the investment customers make in user training.


OS/400 . . . SAA Common Communications Support

- Data Streams
  - DCA
  - IPDS
  - 3270 DS
- Application Services
  - DIA
  - SNADS
- Session
  - APPC/LU 6.2
  - DDM - Record I/O
- Network
  - Lan
  - X.25
- Data Link Control
  - SDLC
  - TR/LAN

OVERTIME
- Network Management

SAA
CCS
OS/400


SAA . . . Common Programming Interfaces

- RPG/400
- COBOL/400
- SQL/400

OVERTIME
- Application Generator - E/400
- C/400
- Procedure Language/400
- FORTRAN/400
- Query/400
- Presentation Manager/400
- Dialog Manager/400
- Communications Interface/400

SAA
Added
Dimension
Connectivity
to MVS/ESA
VM/XA
OS/2-EE
OS/400

The aim is clearly to have people learn to use one part of the SAA product line, and make learning other parts natural, easy, and less of a task, lowering the time, cost, effort and frustrations often faced when learning new applications.

Another aim of SAA is to provide a fully productive use of multiple systems environments, either at one time, or as an IBM user might move from one to another over time.

While protecting customer investment in expensive and scarce programming skills and application software packages through the use of Common Programming Interface (CPI), the architecture will provide languages, tools and services transportable across different SAA systems.

CPI also leverages programmer productivity by freeing programmers from system-specific considerations during design.

The initial elements of the CPI have been defined by IBM around the relational family. They include a variety of programming languages: Cobol (Ansi '85), Fortan (Ansi '77) C (proposed Ansi X3J11).

An application generator (or 4GL) will be based on the now available Cross System Product (CSP). A procedure language to improve the systems-independence of the applications code will be needed.

The interface to the SAA database manager is based on Ansi-database language SQL X3.135-1986, along with IBM's Structured Query Language (SQL) product. The SAA Query Interface will allow an application to enquire against both local and remote relational databases, feeding information into other applications and reports, and satisfying a key requirement for enduser support systems. The IBM S/370 Query Management Facility (QMF) and the query manager of OS/2 Extended Edition have been announced by IBM as the basis of this interface.

With SAA, IBM also plans to make application development more productive through its Dialogue and Presentation interfaces. The Dialogue Interface caters for the definition, display and management of text information, messages and menus, allowing developers to fully control the flow

(Continued page 40)

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(Continued from page 39)

SAA — the message

of interactive screens in application programs.

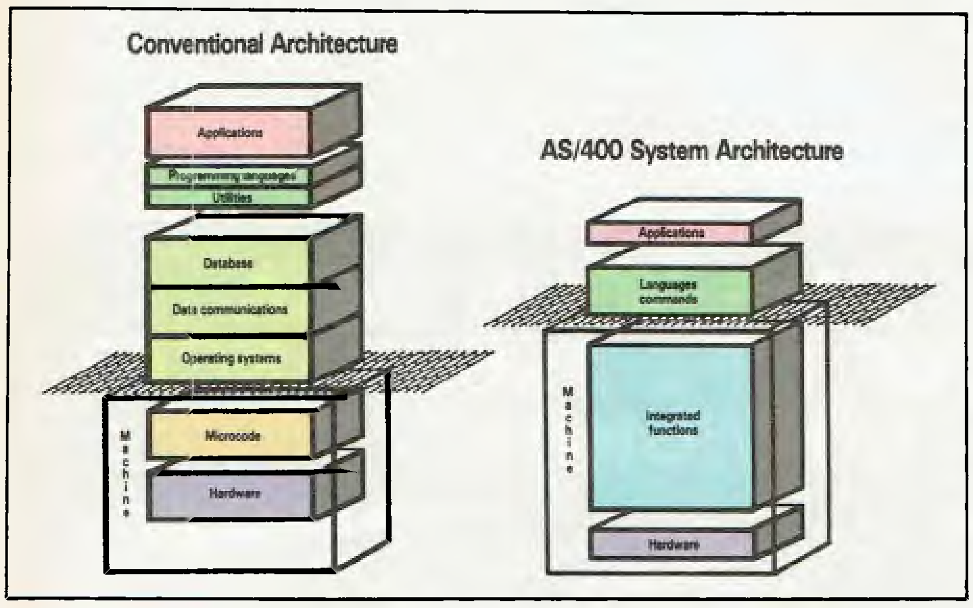
The SAA Dialogue Interface is based on IBM's PC EZ-VU product, and the S/370 ISPF product. The initial announced implementation is OS/2 Dialogue Manager.

The presentation Interface will be based on extensions to the S/370 Graphical Data Display Manager (GDDM) and the OS/2 Presentation Manager. It will provide a range of formatting facilities for alphanumeric and graphic data on displays, printers and plotters.

Although, as IBM freely states, not all the pieces are in place yet, the term goal of CPI is to provide a comprehensive set of program development languages and tools, by additions and extensions to what is announced.

The applications developed in the 1990s using these tools, languages and services will exploit the development productivity gains and be consistent across multiple SAA environments, while performing fully distributed and co-operative processing, using fully distributed relational databases.

The SAA details indicate that, building on IBM's SNA and emerging international standards, open communications for interconnected applications, systems, networks and devices will be catered for in CCS. The objective, increasingly, is to have access to the information when and where it is needed. Where it is stored or processed should be of little or no concern to the user.



IBM intends to continually define in CCS those elements required to achieve this in the SAA environment. The following data streams, application and session services, network and data-link interfaces are included:

- 3270 Data Stream for IBM displays, printers;
- Document Content Architecture (DCA): Form and meaning of revisable-form text documents;
- Intelligent Printer Data Stream (IPDS): High-function format for all-points-addressable printers;
- Document Interchange Architecture (DIA): Document interchange protocols;
- SNA Distribution Services (Snads): Store-and-forward message distribution services;
- SNA Network Management Architecture: Open network problem and performance management;
- Advanced Program-to-Program Control (APPC): Interprogram services via LU 6.2.

Low-Entry Networking (Len): Peer-to-peer network protocols;

- CCITT X.25 Interface: Packet-switching data network interface protocols;
- Synchronous Data Link Control (SDLC).
- IBM Token-Ring Network: Based on IEEE 802.2 and 802.5 protocols.

IBM will offer more protocols, interfaces and standards as they are developed or extended. We can also anticipate high-level CPI interfaces to these CCS elements, so that the communications programming effort involved with implementing new-generation distributed relational databases, and distributed or co-operative processing, will be minimised.

> ‘The term goal of CPI is to provide a comprehensive set of program development languages and tools’

The SAA applications that support endusers' work complete the picture. IBM has said it will begin with a core set of office and decision-support applications for use with SAA. These are being developed in the following areas:

- Document Processing: Electronic capture, storage, distribution and printing of text data in document form — built on IBM DisplayWrite product set.

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- Library Management Storage, retrieval and management of text or image information; electronic mail/file; based on functions in IBM's Distributed Office Support System (Disoss), and in time to incorporate SAA Database Manager.
- Personal Services: Principal/professional support; electronic mail; calendar management; meeting schedules; built on IBM's Professional Office System (Profs) and the Personal Services (PS) family.
- Decision Support: Professional/management analytical tools; based on IBM's Application System (AS).

The sources for common SAA applications will continue to include, as well as IBM, non-IBM software vendors, and IBM customers themselves. The initial IBM focus is on common or cross-industry applications, such as office professional/decision support — but again IBM is only beginning an evolutionary process. SAA manuals published to date are • *An Overview;* • *Common User Access: Panel Design and User Interaction;* • *Writing Applications: A Design Guide;* • *Application Generator Reference;* • *C Reference;* • *Cobol Reference;* • *Database Reference;* • *Dialogue Reference;* • *Fortran Reference;* • *Presentation Reference;* • *Procedures Language Reference;* and • *Query Reference.*

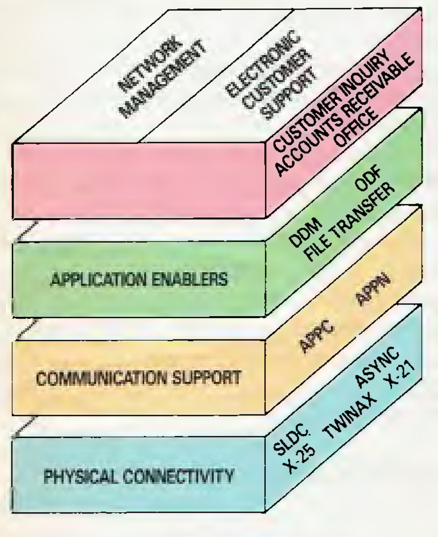
In publishing these, IBM is attempting to encourage software vendors to use IBM's SAA application-enabling products to produce a powerful mix of common, cross-industry, and industry-specific applications. These would span the range of customer business needs, and provide customers with an ongoing portability and growth path across SAA hardware.

SAA is being implemented today with accepted IBM products. But, more important to those enterprises planning for the 1990s, SAA is a plan for IBM to support its most widely used and accepted hardware; to develop and publish CUA, CPI and CCS guidelines as they evolve; and to develop applications conforming to these guidelines.

While publicity about SAA may well be described as low key, it is clear that IBM customers, IBM watchers, and indeed anyone in the information enterprise industry would be unwise to ignore the strategic message behind Systems Application Architecture.

IBM's Systems Application Architecture

Common Applications	Calls for IBM to develop applications that can run across IBM System/370, System/3X and Personal Computer environments.
Common User Access	Defines a consistent enduser interface, including screen layouts and menus, to all IBM applications and environments.
Common Programming Interface	Describes programming tools used in developing applications that can be integrated with other applications and ported to multiple IBM environment.
Common Communications Support	Outlines the protocols, products and services used to interconnect applications, systems, networks and devices.



AS/400 LAYERED COMMUNICATIONS ARCHITECTURE

Printer drivers are installed in 18 sites

By David Hutchins

MELBOURNE — Create!36 and Create!38, Postscript printer drivers for desktop publishing with IBM System/36s and System/38s, have been installed in 12 Australian and six overseas sites.

Developers of the software Creative Laser System claimed it allowed users to take full advantage of the Postscript fonts and graphics resident in laser printers.

CSL director Rod Cuthbert said in addition to the Australian sites, which incuded GRE Insurance, Bunge, and the State Employees Retirements Benefits Board, three packages had been sold in New Zealand and the UK.

CLS has added business graphics abilities to the offering with Create!Chart. It offers the usual bevy of business graphics usually found on desktop systems such as line, bar, pie and stack charts or table format.

It can be used as standalone package and can be merged with text. Because it uses Postscript laser printers its graphics calculations are done in the printer, not in the host.

Cuthbert said Create!Chart could be used across all applications run on System/38s.

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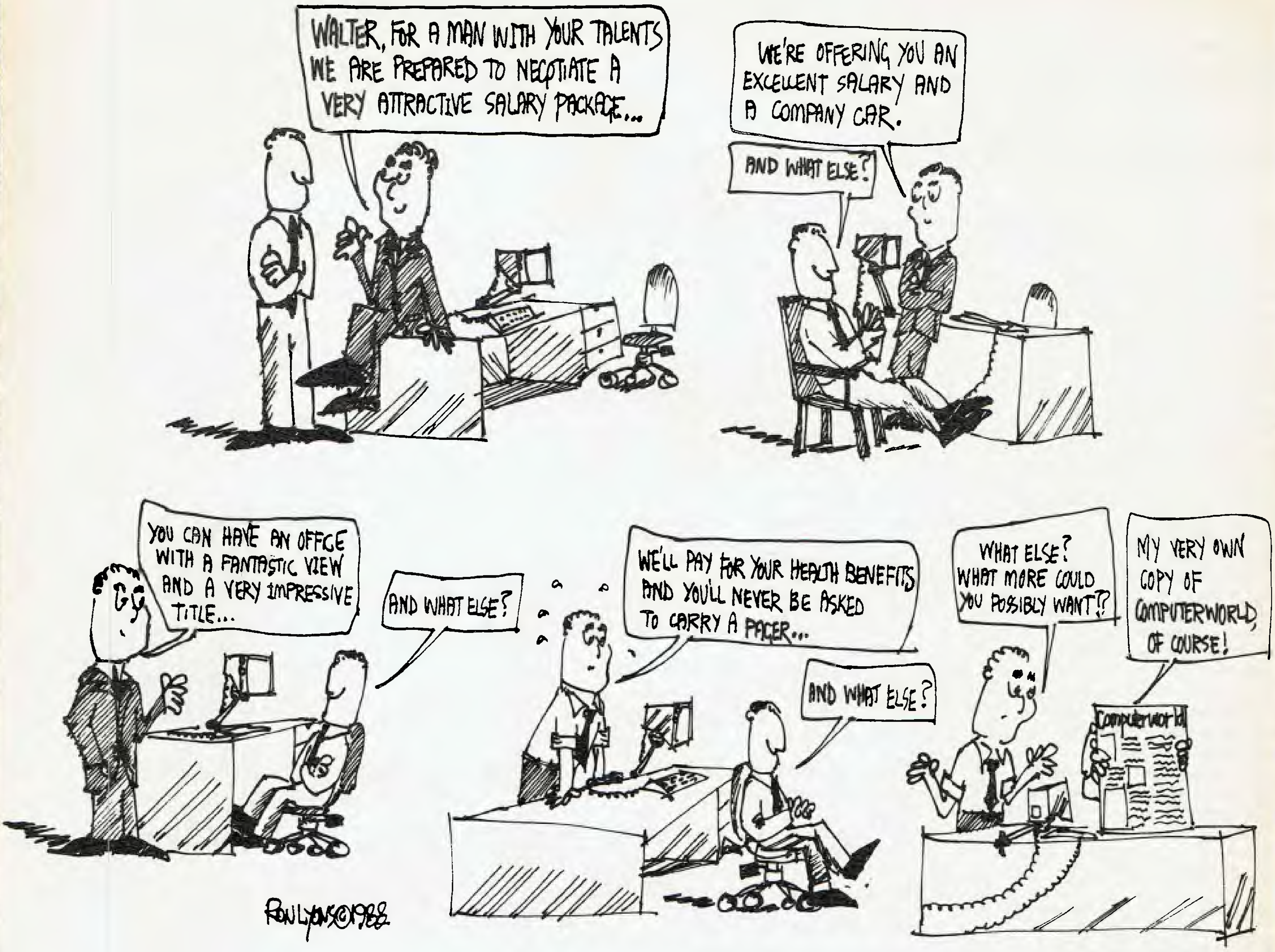
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15 Other

Gateways boost SNA

(Continued from page 43)

dently re-establishing sessions with backup processors even if they are at different sites.

IBM supports source routing, whereby stations on the ring, such as linkage processors, can detect the loss of another station (for example the frontend processor), and initiate a broadcast to find an alternative station even if it is on another ring. This is a perfect technology for this type of application.

By opting for such configurations, fault-tolerant systems can be configured. If the Lan itself is a possible source of failure it makes little difference to the overall architecture if two Lans are used to build a pair of high-speed buses.

Linkage processors will be able to tap into the primary and secondary lines of the backbone network whenever appropriate. In cases of individual trunk failures, they will be able to switch to the alternative route automatically.

With the support of IBM's Network Management Vector Transport (NMVT) hierarchical network management records, no loss of visibility of the downstream network will occur. RECFMS and NMVT records arriving from downstream delivery system devices can be encapsulated within NMVTs generated by the individual processors of the linkage and gateway systems. Likewise, these processors can respond to host-generated requests by stripping the outer NMVT hierarchy and passing it to the downstream device.

> ‘ With the addition of the lowly PC to the Lan, individual transactions can be given priorities ’

Several manufacturers have mastered this technique, including Australia's own Netlink with its SNA Hub. Both Net/Master and NetView provide exits for manufacturers to insert the necessary host software.

By adding a PC directly on to the Lan, organisations will be able to program the frontend for the first time with more popular high-level languages. Transactions can be viewed and reformatted to meet generic message formats and even rerouted to other networks based on their contents.

However, the most important function a directly attached PC provides is related to flow control across the EDS. Old SNA made a significant issue out of transmission groups and explicit routes at a time when the majority of systems were interconnected via one or more low-speed lines of 9.6K-bytes/sec.

Today organisations are stepping up to using 64K-bytes, and even T1, links as the costs for such lines continues to decline. At these speeds, however, organisations still need to be able to give priorities to messages, even if the other portions of flow control are irrelevant.

With the addition of the lowly PC to the Lan, individual transactions can be given priorities.

The PC will also be able to locally load the operating system of each linkage processor and be able to capture storage dumps of failed units.

I agree with many industry analysts who acknowledge that while the Token-Ring Lan was introduced first to the PC world, it will become the single architecture for integrating all of IBM's products. It is also clear that larger bandwidths will begin to be supported this year. They will provide much improved performance and make it even more appealing to manufacturers for use as their own architecture of integration.

The Token Ring Lan is also an OSI standard (802.5) and gives manufacturers the opportunity of capitalising on a standard that is not only included within the OSI world, but is also of major importance to IBM. As organisations begin to understand the size of the investment they have in their network, they are taking a more serious view of basing future investments on products that conform to internationally recognised standards.

These open networks are making more use of fault-tolerant processors as gateways and linkage processors. Since lines can be duplicated, and can even be switched en masse by the telephone companies, and the functionality in intelligent matrix switches continues to improve, it is becoming vitally important that all processors in the EDS be fully fault-tolerant.

But will IBM introduce gateway products of the type I have just described? Will IBM deliver a range of microprocessor-based communication processors that provide organisations with the flexibility and power demanded in the more peer-oriented networks being planned?

These issues facing IBM are all part of the greater problem IBM is having with SNA. Fundamental changes are occurring as IBM migrates away from the hierarchical origins of SNA towards the peer architecture it requires to support the changing way customers use applications.

(Continued page 47)

■ ***Buckle spent a year with Netlink in Raleigh, North Carolina, which is the base for much of IBM's communications research***

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THIRD PARTY SNA GATEWAYS

Edited by
Gillian Sidebottom

THERE is, of course, more to corporate connectivity than simply physical connectivity. The ideal corporate connectivity environment comprises a fully interconnected network to access dissimilar resources — including IBM hosts, departmental processors, network file servers and outside services — and extract distributed data. It should be possible to gain this access without regard to the technical complexity of the required communications and systems integration tasks.

IBM connectivity and full integration of host systems will become increasingly important issues in the near future and gateway products will be seen as the Superglue of connectivity — vital for the interconnection of different protocols.

IBM's SNA (Systems Network Architecture — first announced in 1974) is likely to play a major role, with industry observers tipping it as a dominant standard of the future. SNA gateways have therefore become a strategically important element of many vendors' portfolios, with many successfully creating peer-to-peer solutions for users integrating both standard and non-standard products.

The development of applications by software vendors should mean that in five to 10 years' time the interconnected system will appear to the enduser as a single integrated resource, a mere extension of his own computer environment. As a result, host terminal users will routinely cross from SNA on to local-area networks or across the network.

The Product Spotlight on third-party SNA gateways gives details of those products offered by a range of vendors in Australia. Recent trends include significant improvements in transmission speeds and more robust interfaces.

Product	Product Type	Additional hardware requirements	Protocol Emulations	Display Terminal Emulations	Printer Emulations	Number of terminals supported	Number of active Logical Units/Link	Cluster controller facility	File Transfer	Number of concurrent host sessions/terminal	Access to Host-based Application Subsystems	Documentation	Price ($A inc. tax)
ADE COMPUTERS PTY LTD — 2 Dublin St, East Oakleigh, Vic 3166. Tel: (03) 543 2677													
Adapt SNA 3270 *	H-Adapt Com SDLC or Adapt Coax, S-Adapt SNA 3270	PC with 256K Ram	3274	IBM 3278, 3279	IBM 3287	32	-	✓	Bidirectional	-	✓	-	$1070
Adapt SNA RJE *	H-Adapt Com SDLC or Adapt Coax, S-Adapt SNA RJE	PC with 256K Ram	3274, 3174	IBM 3770 RJE with IBM 8100-type capabilities	-	8	-	✓	-	-	✓	-	$1436
Adapt SNA RJE *	H-Adapt Com SDLC or Adapt Coax, S-Adapt SNA LUO	IBM PC or PS/2 with 256K Ram	LU.O program to program comms over SDLC Coax or Async connectivity	-	-	-	-	✓	-	-	✓	-	PoA
Adapt SNA LU 6.2/APPC *	H-Adapt Com SDLC or Adapt Coax, S-Adapt SNA LU6.2, APPC	IBM PC or PS/2 with 256K Ram	LU 6.2/APPC	-	-	-	-	✓	-	-	✓	-	PoA
* Mainframe communications over standard asynchronous links													
COMPUTER PROTOCOL — 8/33 Ryde Rd, Pymble, NSW 2073. Tel: (02) 498 8588													
CS4XX Family — Network processor CPlan — Local area network	H-CS410, CS432, CPlan, S-IBM-SNA	Async terminal or PC	IBM SNA 3270 SDLC, Bisynch 3770, 2780	IBM 3278, 3279	IBM 3287	32/node	128	✓	Bidirectional Q4 1988	4	MVS, ISO, CICS	✓	PoA
DISC COMPUTER SYSTEMS PTY LTD — Suite 1.02, 38 Oxley St, St Leonards, NSW 2065. Tel: (02) 437 6199													
Interlink network controllers	S — For IBM 9370 only. C — for other IBM mainframes	IBM IEEE 802.3 Network card in 9370. Ethernet, Lan	TCP/IP, Decnet	VT220, IBM 3270	-	As per network	8-256	-	DEC-IBM, IBM-DEC	N/A	✓	✓	$50,000-$350,000
DISTRIBUTED DATA PROCESSING PTY LTD — Level 2, 158 City Rd, South Melbourne, Vic 3205. Tel: (03) 615 6711													
INS Lan Gateway, X.25 SDLC 8100 Loop	H-INS X.25 or SDLC adaptor, S-INS gateway	Netbios compatible Lan	IBM 3270 datastream	IBM 3278, 3279	LU.1, LU.3, Host addressable	8-32	8-32	-	Bidirectional	2	INS PC/Host File transfer	✓	$4495-$8645
Attachmate Extra! 3270 Gateway option	H-Attachmate or IBM 3270 PC, PS/2 Adapter, Coax or SDLC, S-Option to Extra! 3270 connectivity software	Netbios compatible Lan	IBM 3270 datastream	IBM 3278, 3279 (2,3,4,5)	LU.1, LU.3, assignable to Lan printers	32-64	128	✓	Bidirectional	4	Disoss, Host Database view, ECF, TempusLink, CICS, TSO, CMS	✓	Extra! $995+ $120 Gateway option
DATAMATIC DP — 16 Suakin St, Pymble, NSW 2073. Tel: (02) 488 8066													
Novell PCOX/GW-3270 Gateway (Remote)	H-PCOX, SDLC or Remote-assist, S-PCOX/GW-3270 (SDLC or Coax)	-	-	IBM 3178/3179, IBM 3278/3279	IBM 3287	Up to 31	16-64	✓	Bidirectional	1-5	✓	✓	PoA
Novell PCOX/GW-3270, Token Ring Gateway	H-Token Ring interface, S-PCOX/GW-3270 Token Ring	-	-	IBM 3178/3179 IBM 3278/3279	IBM 3287	Up to 31	128	✓	Bidirectional	1-5	✓	✓	Poa
Novell PCOX/GW-3270 Gateway (Coax)	H-PCOX, Coax, Coax-Mux, S-PCOX/GW-3270	-	-	IBM 3178/3179, IBM 3278/3279	IBM 3287	Up to 31	5-40	✓	Bidirectional	1-5	✓	✓	PoA
DATAPOINT CORPORATION PTY LTD — 157 Walker St, North Sydney, NSW 2060. Tel: (02) 922 3100													
Vistagate — Network gateway for Datapoint Arcnet/RMS Lans	H-8MHz IBM AT or comp. S-X-25 or SDLC driver and SNA driver	Datapoint RMS processor	SNA/SDLC or SNA/X.25	IBM 3287(2) 3777(1)	IBM 3287(2)	16/gateway	16	✓	Bidirectional	8	CICS, TSO, IMS	✓	PoA
HEWLETT-PACKARD AUSTRALIA LTD — 31-41 Joseph St, Blackburn, Vic 3130. Tel: (03) 895 2644													
HP LU 6.2 Base	S-SNA high level services software	HP SNA Link	SNA LU 6.2	Displaywriter LU emulation	-	-	-	-	-	-	-	-	$8268-$26,906
SNA Link	C-Comms board & driver software	-	SNA PU 2	-	-	-	-	-	-	-	-	✓	$13,080-$31,560
SNA NRJE	S-SNA high level services software	HP SNA Link HP3000	SNA PU 2, L1 (IBM 8100) DPPX/RJE	-	-	-	Up to 8	-	-	1	✓	✓	$6204-$24,818
SNA IMF	S-SNA high level services software	HP SNA Link	SNA PU 2, LU.1, LU.2, LU.3	IBM 3274/76 base functions	-	-	64	✓	-	1	✓	✓	$9030-$35,630
HONEYWELL BULL PTY LTD — 124 Walker St, North Sydney, NSW 2060. Tel: (02) 923 9624													
OSF/SNA	H-Datanet 8, S-DNS, OSF/SNA	-	SNA/SDLC for PU.4, PU.2 and X.25	3270 BSC connected to the DSA network 3270 SNA connected to an SNA host	3284(2)	120	120	✓	DSA-United File Transfer to IRM MVS	1	ISO, CICS, IMS Netview/NCCF	-	PoA
3+ SNA	PC AT compatible interface card and software	PC	SNA/SDLC HLL API Ver 3.0 Application Interface	3278/79 (2,3,4,5) 3270	LU.1	32/Server	512/Lan Segment	✓	FFT-CKS, FFT-CMS FTT-TSO	8 host, 1 Dos	CICS, CMS, TSO	✓	$9277
ITF/RJE/Application Interface/File Transfer	H-DP56, M400, MVS	-	LU 0, LU 6.2, PU.2	3278	3287	32 (3274 emul.)		✓	Bidirectional	1	CICS, IMS, TSO Power	✓	PoA
NATIONAL ADVANCED SYSTEMS — 11-17 Khartoum Rd, North Ryde, NSW 2113. Tel: (02) 887 4455													
SBe X 3270/Novell	C-single-board or standalone with power supply and card	-	SDLC, SNA, Async	IBM 3270, 3278, 3279	IBM 3287	To 64	To 64	✓	-	5	CICS, CMS, TSO	✓	$4000-$8600
Note: Distributor enquiries welcome													
UNISYS AUSTRALIA LTD — 30 Alfred St, Milsons Point, NSW 2061. Tel: (02) 963 6000													
SNA and Bisynchronous connectivity	C-Full 3270 SNA, 3770 SNA and Batch remote	Emulator board, software and cable	IBM 3278, 3274, PU.T2 LU.12, LU.13, LU.T1	IBM 3270, 2780/3780 3274, 3278	All standard	Lan — up to 32	-	✓	Bidirectional	-	✓	✓	PoA

Key: ✓ heading applies; - heading not applicable, or information not supplied; PoA price on application; Products Type: S/H/C Software/Hardware/Combined

The Product Spotlight on Third-party SNA Gateways is based on information provided by respondents to a survey of vendors conducted between May 16 and June 24, 1988. All details should be checked with the companies as listed.

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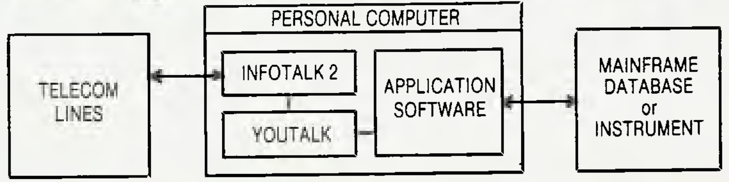

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Gateway ‘mesh’ the key to two-tier SNA

(Continued from page 45)

In a recent interview Ellen Hancock, president of IBM’s Communication Product Division, gave to the US publication *Network World,* a sister publication to *Computerworld Australia,* she said: “Our goals are to enhance our customers’ connectivity, provide them with end-to-end network management, give them total integrated systems offerings, rather than just independent pieces of the puzzle, and, finally, help them focus on the growth of their networks while decreasing the cost of that growth.”

She then added: “I’m not going to refer directly to DEC or Decnet, but I will tell you that I think the work we have (done) in SNA, the work being done by APPN, LU6.2 and the Len architecture and its support by the Vtam host, is unmatched in the industry. I am not aware of any other architecture as robust, and I believe it gives us strength beyond any other vendor. I believe the network management we provide is unmatched in the industry. I’m not sure I’d get too many challenges on that.”

George Colony, president of Forrester Research, was not quite so positive when he told *Datamation:* “Until recently, IBM just hasn’t understood the software challenge it faces. So much of its connectivity software originated as mainframe-oriented software that it doesn’t work very well in a distributed environment. I often wonder if it can ever break away from that orientation. Turning SNA into a distributed processing network is like kicking a dead whale down the beach.”

Like many Australians, I have become bit of a Net/Master fan of late, so I will not comment further on Ellen Hancock’s challenge! However, what comes through here is IBM’s clear perception that old SNA has proved to be a robust product.

As such, it will be enhanced over time into New SNA to meet the challenge of building the more peer-oriented networks its customers are calling for. What also comes over here is the cynicism of one industry analyst that IBM will be able to meet the challenge!

IBM has a real problem. It knows what type of networks its customers want, and has introduced several pieces of the new architecture. It also recognises it has to “open” its architectures so that more manufacturers are attracted to them, as de facto standards. This is something it started to do in September 1986 when it announced Open Communications Architecture (OCA).

However, IBM does not always release products for the right reasons, or as a result of selecting the right technological solution. Right now IBM has significant investments in major hardware components some of which, like the 3745, have only just been announced. These investments are often in areas where IBM occupies a dominant position.

When it comes down to networking there simply is no incentive today for IBM to radically alter the products it has. As it actively promotes the concepts of EDS it continually falls back on existing technologies to implement them.

The only revenue stream that would be hit by breakthroughs in this area would be IBM’s To fully support peer networks that reflect the two-tier nature it depicts requires gateway processors of a type that would simply threaten the revenues it generates now from its present communications processors.

Organisations with major investments in IBM mainframe technology, and committed to SNA as their network architecture, have to face up to the reality that their major vendor may not be providing them with the technology to meet networking objectives.

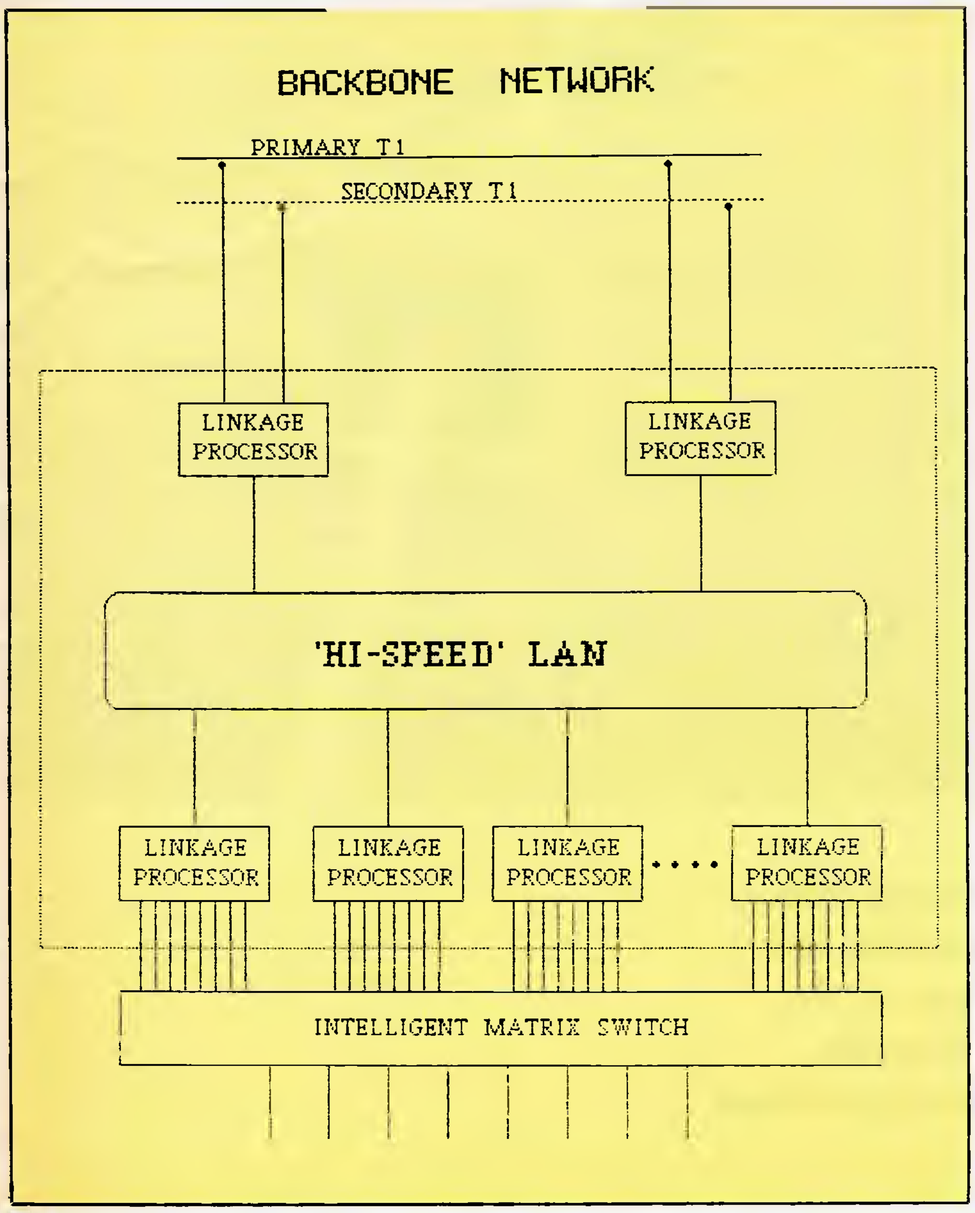
IBM has been somewhat successful in selling its concept of open architectures and has begun producing products that feature the use of open interfaces. The whole world of 2.1, its PS/2 product, network management, the Token-Ring, are all instances.

But as IBM customers push ahead with the implementation of open networks under SNA, where there is an increasing demand for more flexible gateway products, and where higher network availability is a prerequisite, it is becoming increasingly likely that other suppliers will fill the holes.

It is somewhat frustrating for these organisations to be placed in a position where the only way to get IBM to deliver the products they need is tied directly to the rate at which other suppliers become successful. Success by other suppliers in this area will eventually force IBM to respond.

This time, however, IBM may find itself too far behind. Its need to protect ongoing revenue streams may finally drive its customers to suppliers more responsive to their needs.

It may eventually become too big a task for IBM to unhook these customers off competitors’ products sitting in the middle of “their” networks. It will be even more difficult to sound convincing when those solutions to customers’ connectivity problems have been provided in a manner consistent with IBM’s own published architectures.



■ *Figure 2: A remote linkage processor package*

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